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TWENTY-FOURTH ANNUAL REPORT

LELAND STANFORD JUNIOR
UNIVERSITY

STATE BOARD OF HEALTH OF INDIANA

FOR THE

FISCAL YEAR ENDING OCTOBER 31, 1905,

AND

STATISTICAL YEAR ENDING DECEMBER 31, 1905.

TO THE GOVERNOR.

INDIANAPOLIS:

WM. E. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING.
1905.

YRABU

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THE STATE OF INDIANA,
EXECUTIVE DEPARTMENT,
INDIANAPOLIS, December 14, 1905. }

Received by the Governor, examined and referred to the Auditor of State
for verification of the financial statement.

OFFICE OF AUDITOR OF STATE,
INDIANAPOLIS, December 22, 1905. }

The within report, so far as the same relates to moneys drawn from the
State Treasury, has been examined and found correct.

WARREN BIGLER,
Auditor of State.

136248

December 22, 1905.

Returned by the Auditor of State, with above certificate, and transmitted
to Secretary of State for publication, upon the order of the Board of Commis-
sioners of Public Printing and Binding.

FRED L. GEMMER,
Private Secretary.

Filed in the office of the Secretary of State of the State of Indiana,
December 23, 1905.

DANIEL E. STORMS,
Secretary of State.

Received the within report and delivered to the printer this 23d day of
December, 1905.

HARRY SLOUGH,
Clerk Printing Bureau.

MEMBERS OF THE BOARD.

T. HENRY DAVIS, M. D., PresidentRichmond.
CHARLES M. EISENBEISS, M. D., Vice-President...Elkhart.
F. A. TUCKER, M. D.....Noblesville.
WM. N. WISHARD, M. D.....Indianapolis.
J. N. HURTY, M. D., Phar. D., Secretary.....Indianapolis.

REPORT

OF THE

INDIANA STATE BOARD OF HEALTH.

TWENTY-FOURTH ANNUAL REPORT.

HON. J. FRANK HANLY, *Governor of Indiana:*

The State Board of Health herewith respectfully presents its twenty-fourth annual report, wherein is reported the transactions of the Board, an account of expenditures, and an account of the work done in the State Laboratory of Hygiene, for the year ending October 31, 1905. The report also contains the vital statistics for the calendar year ending December 31, 1905.

MEETINGS OF THE BOARD.

The four regular quarterly meetings of the Board were held in their respective quarterly periods, and in addition, special meetings were held December 15-16, 1904; April 10, April 21, June 1 and September 6, 1905. The minutes of all of these meetings with the Board's fiscal statement make up the first part of this report.

STATE LABORATORY OF HYGIENE.

After presenting the importance of establishing a State Laboratory of Hygiene to four separate General Assemblies, our petition was granted by the sixty-fourth session. The laboratory was made a department of the State Board of Health, \$5,000 was appropriated for equipment and \$10,000 per annum for maintenance. The law created two divisions, *Chemical* and *Bacteriological*, and commanded the appointment of a Chemist and Bacteriologist with such employes as the Board might deem necessary.

The law went into effect in April, and immediately the State Board commenced the work of enforcement. The Custodian of

the State House set aside rooms 19-20 in the basement for the Chemical Laboratory and room 122 for the Bacteriological Laboratory. Prof. H. E. Barnard, B. S., of Concord, N. H., was appointed Chemist, with Mr. H. E. Bishop, B. S., of Indianapolis, as assistant; and T. Victor Keene, M. D., of Indianapolis, was appointed Bacteriologist, with Helen Knabe, M. D., of Indianapolis, as assistant. Mr. Louis Bristol was appointed Deputy Food and Drug Inspector. Much of the equipment was purchased in Germany and imported duty free. This saved considerable money but caused a delay of several weeks. Further delays were experienced in getting cabinetmaker's and carpenter's contracts fulfilled, for seasoned lumber was not immediately obtainable and the demand for labor was very great among contractors. For these and other reasons, the opening of the Chemical Laboratory was not possible until the middle of September, and the Bacteriological Laboratory is not yet in full operation, but it certainly will be by December 1st. At the present time, daily examinations of sputa, diphtheria cultures, and blood tests are being made in the interests of public health work. In the Chemical Laboratory to date, 3,860 food and drug samples have been purchased and are being analyzed as fast as possible. Adulterated milk has been found in Terre Haute, Evansville, Jeffersonville, Huntington, Indianapolis and other places and the respective prosecutors have been supplied with all data for prosecution. Sausage and canned meats have been found preserved with borax and artificially colored, making unwholesome food. Vinegars, sold for pure cider vinegars, have been purchased and found to be false. Proper steps have been taken to right this wrong.

We are pleased to be able to report that the Board has received assurances from the State Wholesale and Retail Grocers' Associations, also the State Wholesale Drug Dealers, also many large manufacturers of food products, that they are in favor of the Pure Food and Drug Law and, while closely conforming to the same, will aid all they can in its enforcement.

VITAL STATISTICS.

The vital statistics which are collected for the calendar year can not be presented until the year expires, December 31, 1905. It will then take fully ninety days to tabulate and analyze the figures.

7

The mortality statistics are carefully collected and are known to be accurate. Every death is reported, and is recorded in the locality in which it occurs, and original death certificates are preserved in the records of the State Board of Health, where at any time, citizens may secure transcripts without charge.

EPIDEMICS.

The epidemic of smallpox which began in 1899 and reached its highest point in January and February, 1903, has gradually declined in intensity and area until in October only ten mild cases with no deaths were reported. We do not have to record any extra severe epidemics of typhoid fever, scarlet fever, or diphtheria, but the report of the Secretary to the Board at its October meeting gives a detailed account of two typhoid outbreaks, one at Etna Green, Kosciusko County, and one in Union County. Consumption, of course, is endemic and still continues to cause more deaths than typhoid, diphtheria, and scarlet fever.

RECOMMENDATIONS.

In accordance with the law which makes it the duty of the State Board of Health to make such recommendations as may seem proper, we respectfully recommend as follows:

A REGISTRATION LAW.

The registration law passed in 1899 and under which the mortality statistics have been so correctly collected, was declared unconstitutional by the Supreme Court in February, 1904. This law was an amendment to the Health Law of 1891 and it was discovered that the title of the amended law was incorrectly quoted in the new act, one line being omitted. This was the sole point upon which the decision was based. As the law of 1891, which now became operative, contained some provisions for registering deaths, births and contagious diseases, the Board decided to continue the system which prevailed under the new law, and to this date mortality statistics have been collected through the momentum acquired from the law of 1899.

The necessity of an efficient registration law plainly exists, and the authority and power conferred upon the State Board of Health

for its enforcement should be sufficient in every way. Later, the State Board will present for the Governor's consideration a draft of what it thinks this law should be.

SANITARY SCHOOLHOUSES AND TEACHING HYGIENE IN THE PUBLIC SCHOOLS.

We suggest a statute requiring that all schoolhouses hereafter built shall conform to natural sanitary laws; also that the act should contain a clause requiring that hygiene be taught in the public schools. Not less than 10 per cent. of school moneys are now wasted on account of unsanitary schoolhouses, in which start most of our epidemics and in which are laid the foundations in many for consumption and other diseases in after life. Massachusetts, Michigan and other States have statutes of the character we propose, and better health and progress among the school children has thus been secured.

A STATE HOSPITAL FOR INDIGENT CONSUMPTIVES.

Massachusetts, New York, Rhode Island and others have provided State hospitals for consumptives, and Maryland, Pennsylvania, Michigan and other States are considering the matter. Both humanity and economy demand such institutions in every State. At present, fully 1,000 poverty-stricken consumptives are being cared for at public expense or by private charity in Indiana, but in such manner as to spread the disease and not restore to health a single patient. The proposition to establish a State hospital for indigent consumptives is not one to unnecessarily spend money, but is a measure to more wisely expend the money now devoted to caring for these unfortunates.

We believe that all of these recommendations are wise, and would, if put in force by the State, save money to the people and materially promote the public happiness.

(Signed)

T. HENRY DAVIS, President.
C. M. EISENBEISS, Vice-President.
W. N. WISHARD.
F. A. TUCKER.
J. N. HURTY, Secretary.

FIRST QUARTER.

Special and Regular Meeting.

SPECIAL MEETING.

December 15-16, 1904.

Present: Drs. Wishard, Eisenbeiss, Davis, Cook and Hurty.

Called to order by President Wishard at 12 m., December 15th.

The object of calling the meeting was to attend the Health Officers' School, to consider and allow expenses, and do whatever seemed necessary.

The Secretary reported the attendance on the school as better than last year and the interest excellent.

Secretary presented the Bruce Lake matter, which, after consideration, was temporarily laid on table.

Adjourned to meet next day at 9 a. m.

SECOND SESSION.

Board met according to adjournment at first session.

Present: Drs. Wishard, Cook, Davis, Eisenbeiss and Hurty.

The Legislative Appropriation Committee called and was received by the Board. The committee asked to see the accounts and have the workings of the office explained. The Secretary was called upon and gave a verbal account of the affairs of the Board, after which the following resolution was adopted:

Resolved: The State Board of Health respectfully recommends to the Legislative Committee on Appropriation that the sum of \$14,000 be appropriated for public health work, and we request that your honorable committee recommend that the above sum be appropriated by the Legislature.

The proceedings of the Health Officers' School were further discussed and it was the individual expression of each member that this, the last school, was the most successful yet held by the Board.

REGULAR QUARTERLY MEETING.

January 13, 1905.

First quarter of the calendar year, second quarter of the fiscal year.

The affairs of the first quarter of the fiscal year considered.

Called to order at 3 p. m. by Dr. Cook, Vice-President.

Present: Drs. Cook, Davis and Hurty.

Proceedings of last meeting read and approved.

REPORT OF SECRETARY FOR QUARTER.

Health in Indiana During the Quarter.—The death rate for the quarter was 12.1. In same quarter of 1903 it was 12.5.

Bronchitis, tonsilitis, rheumatism, influenza and pneumonia were the most prevalent diseases, and no increase existed over the same quarter of 1903.

The following table gives the status of smallpox:

	Number of Cases Reported.	Deaths.	Number of Counties Invaded.
October, 1903	324	1	31
October, 1904	226	18	26
November, 1903	324	1	33
November, 1904	355	12	37
December, 1903	523	2	40
December, 1904	472	8	38

By the above table the comparison shows: Cases decreased, 10 per cent.; deaths increased, 850 per cent.; area invaded decreased, 2.8 per cent.

VISITS.

The Secretary made seven visits and inspections, as follows:

October 31st, Thorntown, on account of smallpox.

November 2d, Atlanta, on account of inspection of schoolhouses.

November 29th, Kentland, on account of inspection of schoolhouses, to give advice upon municipal sanitation to town board.

December 7th, Muncie, on account of public water supply and to address city council,

December 13th, Greencastle, on account of municipal sanitation.

December 20th, Bloomington, on account of municipal sanitation, and sanitary lecture before students.

December 31st, Noblesville, on account of diphtheria.

THORNTOWN.

On October 31st a visit was made to Thorntown on account of a telephone message from the chairman of the town board of trustees and Dr. Rose, town health officer. Both reported that many cases of an eruptive disease existed, which was pronounced by some physicians to be smallpox, and by others was pronounced chickenpox, and they wished a decision of the State Board of Health, with advice.

Upon arriving, with Dr. Rose and other physicians I visited seven houses, and in all of them typical cases of smallpox were found. The town authorities were eager to do what was necessary, only they did not know how to proceed. A good supply of smallpox circulars was furnished and specific directions given, including strong recommendations for public vaccination. The work began immediately, and within three weeks smallpox had disappeared from the town. One feature of interest was the discovering of a case of smallpox in a teacher in the schools. The case was very mild and was unmistakable. All the children in the room were vaccinated and the teacher placed in quarantine. Only three cases proceeded from the room afterward.

ATLANTA.

On November 2d I visited Atlanta, on account of invitation from the county superintendent, and also the town superintendent of schools. The object was to make sanitary inspection of the new schoolhouse and test the ventilating and heating apparatus, and deliver a lecture on general sanitation to the high school students. The program was completely carried out. The heating and ventilating apparatus was found efficient and sufficient. The new schoolhouse is satisfactorily lighted, and sewage disposal is also satisfactory.

KENTLAND.

Upon invitation of the president of the town board of trustees and Senator McCain, I visited Kentland to give a public lecture upon hygiene and to consult with the officials in regard to municipal sanitation. The town has no sewers and the people are only partially supplied with public water. The question of sewage was fully discussed, and it is probable that in the spring the town board will take what action is necessary and commence a system of sewers. The schoolhouse is a new one and is built according to modern sanitary principles. The ventilating and heating was found to be up to requirements, as also the lighting. The sewage disposal was by water carriage.

MUNCIE.

Serious conditions exist in relation to the water supply at Muncie, and it was in regard to this matter that I visited the city to confer with the officials and the Commercial Club. Upon inspection, I found that the public supply proceeds from wells and the river. There are in all nine wells, of varying depth, some of them over eighty feet. These furnish about one million five hundred thousand gallons of pure water, and this is supplemented by 500,000 gallons of filtered water from White River. There is no fault to be found with the well water except that it is quite hard. The river water presents serious difficulties. Above Muncie is a well-known oil region of Indiana, and from the oil wells there proceeds a great quantity of salt water, which is impregnated with the flavor and taste of coal oil. This is discharged into the river, with the result that the river water is becoming very salty, and tastes of coal oil. Filtration of the river water deprives it of germs, making it clear and bright, but the salt remains, and also the coal oil flavor and odor. It was concluded that the remedy for the trouble lay in drilling more wells at a distance, and erection, if necessary, of a second pumping station. It was proposed, if practicable, to try to secure from the Legislature special legislation prohibiting the discharge of salt water from the oil wells into White River. The artificial ice plants at Muncie at the present time are furnishing distilled water to families at five cents per gallon. Those who can not afford distilled water are using well water. This is, of course, risky, for most of the wells thus used have for a

long time been unused, and were ordinarily abandoned because of probable pollution. At this time the Muncie Water Company is putting down a number of new wells, and expects to be able to furnish an abundant supply in due time.

GREENCASTLE.

December 13th, I visited Greencastle, in order to deliver a public lecture upon "Tuberculosis in Indiana." This lecture was delivered to the county medical society and physicians. After the lecture was delivered, together with Dr. King, local health officer, a sanitary inspection of the county orphan asylum was made. The building is a brick farmhouse, which was originally constructed by a farmer, who had to give it up, as his fortune was not equal to the expense. The county purchased the building, which has been remodeled, and it was agreed to be used as a county orphan asylum. There were seven inmates at the time of the visit, all of them well and properly cared for. The house was provided with a bathroom, and was as sanitary as a stone and brick house built in the country usually is. The only method of ventilation is by windows, and the warming by a furnace. All but one of the children attend school, and this one, being feeble-minded, is not accepted by the school authorities.

BLOOMINGTON.

I visited Bloomington December 20th, upon invitation to consult in regard to public sanitation and to deliver a lecture upon "Tuberculosis in Indiana" before the students of the university. The desirability of more extensive sewers was discussed; also the public water supply, also sanitary improvements around the public square. The lecture was delivered in the lecture room of the new science hall, before a large body of students and citizens, and the county medical society. Resolutions of thanks and appreciation were passed upon conclusion.

NOBLESVILLE.

Upon request of Dr. Tucker, I visited Noblesville to confer in regard to an outbreak of diphtheria. Several cases of obscure throat disease had occurred, which had been passed as "colds," and there followed an outbreak of eight or ten cases of diphtheria, with

two deaths. Cultures were taken from throats of four children and afterward examined, but all found to be negative. Doubtless some of the so-called colds were mild diphtheria. This conclusion seems warranted by the fact that all of the recognized cases associated with those which were diagnosed as bad colds.

LABORATORY WORK.

The Secretary examined, at his own expense, seventeen diphtheria cultures, nine of them being positive and eight negative. Twelve water analyses were made, and four found polluted and condemned. Sputum examinations numbered fourteen, ten of them being positive and four negative.

PERMITS TO DISCHARGE WASTE INTO STREAMS.

Applications having been made in due form and inspections made as the law directs, all of said applications and inspections were duly considered, and the following permits ordered:

REPORT OF INSPECTION OF CONDITION AT T. A. SNIDER PRESERVE COMPANY'S FACTORY, TIPTON.

Gentlemen—According to instructions I visited and inspected the T. A. Snider Preserve Company's factory at Tipton, October 17, 1904.

This factory is a two-story and loft brick building, 65 feet by 175 feet, with a boiler room on the northeast corner 16 feet by 30 feet, one-story brick detached and all floors cemented. The work of this factory is making, bottling and barreling catsup exclusively, and they have a capacity of 125 gross of bottles and 150 barrels per day.

It is situated about one-half mile east of the railroad junction on the north side of the L. E. & W. R. R., in the northeast corner of the city limits. The company owns twelve acres of ground abutting and north of the railroad and have the use of over 200 acres more for a dumping ground for their refuse and waste. There was no repellant odor from this ground, although rotten tomatoes and waste from the kettles were spread all over it. The nearest residence to the factory is across the railroad south about 200 yards, and the next nearest is a farm house between one-fourth and one-half mile northeast.

All the scalding, cooking and shredding is done in the east end of the building, the different tanks are connected with a cement gutter or trough, which empties into a tile sewer, which in turn empties into a catch basin across the railway switch near the southeast end of the building. This trough has two sets of wooden slats that catch all but the smallest pieces of debris that come from the tanks when washed or scalded. The catch basin also allows any large piece of tomato or onion

to settle to the bottom and be removed without getting into the main sewer. From this catch-basin a tile is laid under the tracks of the L. E. & W. R. R. south about 200 feet to the city sanitary sewer, where it is connected and the waste is carried by that sewer about one mile directly south to its outlet into Cicero Creek. Cicero Creek is the outlet for all the city storm water and sewage, and is a small shallow stream running from the southwest to northwest through the southeast part of the city, and at date of visit was so low that there was but very little current. At the sewer outlet there was some tomato skins and waste and the water was discolored somewhat, but only near the mouth of the sewer. The only odor perceptible was that of sewage. I would state in this connection that the Johnson Canning Factory in the northwest part of the city also empties its waste water into the same sewer, and as that factory does an exclusive and very large canning business, it would be impossible to say from which factory the waste observed at the mouth of the sewer came. There is another catch-basin southwest of the factory building into which the waste water from the boiler room, from the tanks where the bottles are boiled after filling, and scrub water from the floors of the bottling rooms empty, and is also connected with the sewer across the railway.

The manager of the factory, Mr. Charles Nuber, gave me every facility for examining the factory and its workings and seemed very anxious to have any advice or instructions that I deemed necessary. The factory is in excellent shape, free from any unpleasant odor and very clean. In my opinion it is a benefit to all parties concerned to allow the waste water from the factory to empty into the sanitary sewer and thus assist in flushing the sewer and diluting the sewage.

I recommend the granting of the permit as asked for.

Respectfully submitted,

JAMES L. ANDERSON,

Deputy State Sanitary Inspector.

PERMIT TO DISCHARGE WASTE WATER INTO CICERO CREEK.

Whereas, The T. A. Snider Preserve Company, a corporation owning a plant in Tipton, Indiana, has presented a verified application in writing asking permission to discharge waste matter from their factory into a four-inch sewer which empties into the city sewer, and which city sewer empties into Cicero Creek, and

Whereas, The State Board of Health has made an inspection at and below the point of discharge into Cicero Creek and finds that the said waste may be safely discharged into said stream without injury to the public, therefore, it is

Ordered, That the T. A. Snider Preserve Company is permitted to discharge its waste matters, consisting of washings from the factory, into Cicero Creek through the sewers before named, until July 1, 1906.

Unanimously passed January 13, 1905.

**PERMIT TO DISCHARGE WASTE WATER INTO WILD
CAT CREEK.**

Whereas, The American Strawboard Company of Kokomo, a manufacturing establishment for the manufacture of paper from old paper stock, respectfully petitions, according to law, for a permit to discharge waste water from its factory into Wild Cat Creek, and as inspection has been made, said waste water found to be simply water from deep wells which has been used for washing old newspapers, and the pulp therefrom, and as said waste by analysis is found in no degree to be of a polluting character, therefore,

Permit is hereby granted to discharge into said Wild Cat Creek, from January 1, 1905, until January 1, 1906.

Passed by the State Board of Health, January 13, 1905.

**PERMIT TO DISCHARGE WASTE INTO THE MISSISSINEWA
RIVER.**

Whereas, The American Sheet and Tin Plate Company, a corporation owning a tin plate plant at Gas City, Grant County, Indiana, has heretofore filed with the Secretary of the State Board of Health of Indiana, its verified application in writing, asking a permit to allow the overflow from the company's pond at said plant, to discharge into a stream in said State known as the Mississinewa River, showing in such application that said stream was at the time of filing and making said application, at such a stage that such overflow might be safely discharged into said stream without injury to the public, and

Whereas, Said State Board of Health has duly inspected said stream above, at and below the point of such proposed discharge, and has found and finds that such overflow may for the period hereinbelow fixed, be safely discharged into said stream without injury as aforesaid, and furthermore finding that said overflow is as pure as the waters of Mississinewa River,

Now, Therefore, said State Board of Health hereby grants and issues this, its written permit, hereby granting permission to said American Sheet and Tin Plate Company to flow and discharge the overflow from the pond at its plant at Gas City into Mississinewa River from a period extending from the date hereof, to the 1st day of January, 1906.

This permit is given this day, January 13, 1905, by the State Board of Health, all members being present and concurring.

PERMIT TO DISCHARGE WASTE WATER INTO DUCK CREEK.

Whereas, The American Sheet and Tin Plate Company, a corporation owning a tin plate plant at Elwood, Madison County, Indiana, has heretofore filed with the Secretary of the State Board of Health of Indiana, its verified application in writing, asking a permit to discharge into a stream in said State known as Duck Creek, certain liquid wastes from the rolls, engine pits and boshes, also "spent pickle," and the sewage

from the plant, and showing in such application that said stream was, at the time of filing and making such application and at various other times was at such stage that the wastes, pickle and sewage might be safely discharged into said stream without injury to the public, and,

Whereas, Said State Board of Health has duly inspected said stream above, at and below the point where said wastes enter Duck Creek, and has found and finds that said wastes may for the period hereinbelow fixed, be safely discharged into said stream without injury to public health, as aforesaid, and furthermore, finding that wastes, "spent pickle" and sewage will not cause any unsanitary conditions,

Now, Therefore, said State Board of Health hereby grants and issues this its written permit, hereby granting permission to said American Sheet and Tin Plate Company to flow and discharge the wastes from the rolls, engine pits and boshes, also "spent pickle" and sewage of its plant at Elwood, into Duck Creek, for a period extending from the date hereof, to the 1st of January, 1906.

This permit is given this day, January 13, 1905, by the State Board of Health, all members being present and concurring.

PERMIT TO DISCHARGE LIQUID WASTES INTO KILL BUCK CREEK.

Whereas, The American Sheet and Tin Plate Company, a corporation owning a tin plate plant at Anderson, Madison County, Indiana, has heretofore filed with the Secretary of the State Board of Health of Indiana, its verified application in writing, asking a permit to discharge into a stream in said State, known as Kill Buck Creek, certain liquid wastes from the rolls, engine pits and boshes, also "spent pickle" and the sewage from the plant, and showing in such application that said stream was, at the time of filing and making such application, and at various other times was at such stage that the wastes, pickle and sewage might be safely discharged into said stream without injury to the public, and

Whereas, Said State Board of Health has duly inspected said stream above, at and below the point where said wastes enter Kill Buck Creek, and has found and finds that said wastes may for the period thereinbelow fixed, be safely discharged into said stream without injury to the public as aforesaid, and furthermore finding that said wastes, "spent pickle" and sewage will not cause any unsanitary conditions,

Now, Therefore, said State Board of Health hereby grants and issues this its written permit, hereby granting permission to said American Sheet and Tin Plate Company, to flow and discharge the wastes from the rolls, engine pits and boshes, also "spent pickle," and sewage of its plant, at Anderson, into Kill Buck Creek, for a period extending from the date hereof, to the 1st of January, 1906.

This permit is given this day, January 13, 1905, by the State Board of Health, all members being present and concurring.

SECOND QUARTER.

Regular and Special Meeting.

REGULAR QUARTERLY MEETING.

April 7, 1905.

Second quarter of the calendar year, third quarter of the fiscal year.

The affairs of the second quarter of the fiscal year considered.

Called to order at 3 p. m. by President Wishard.

Present: Drs. Wishard, Davis, Cook, Eisenbeiss, Hurty.

Minutes of the special meeting held December 15-16 read and approved.

Minutes of last regular meeting read and approved.

REPORT OF SECRETARY.

The routine work of the office during the quarter has proceeded as usual, without interruption and without unusual incident.

The Sixty-fourth General Assembly adjourned March 6th. The Laboratory Law, which this board has had before each General Assembly for the last four sessions, was finally passed in satisfactory form. A joint resolution was also passed, creating a tuberculosis commission, to investigate the subject of tuberculosis in the State of Indiana. The health bill which was prepared by the Board and presented for passage failed by being held up by the Speaker of the House, although it was essentially a copy of the act of 1899, which was declared unconstitutional because an enrolling clerk left out one line in the title of the act. Purely on account of the fact that this bill was intended to increase the efficiency of the State Board in the matter of collecting vital statistics and other health work, its failure is to be regretted. Other laws having some degree of reference to the public health and which were passed were:

Affecting the registration of nurses.

Creating a new hospital for the insane, having the legal title of "Southeastern Hospital for Insane."

A bill which has been called "The Anti-Cigarette Bill," which prohibits cigarettes in any shape or form in the State of Indiana.

INDUSTRIAL SCHOOL FOR GIRLS.

This law separates the young women in the Woman's Prison and puts them into a separate establishment.

VILLAGE FOR EPILEPTICS.

This law creates a village for epileptics, \$150,000 being appropriated for the purpose.

An amendment to the medical bill gives recognition to the osteopaths by appointing a member of this cult upon the medical board.

A new veterinary law was passed.

COUNTY HOSPITALS.

This law amends a former law and allows a county to use for hospital purposes any suitable grounds and buildings already owned by it, not otherwise at the time in actual use, where a hospital association will remodel and repair them, so as to fit them for use as a hospital at its own expense.

YOUTH AND DANCE HALLS.

This provides that any proprietor of any dance hall, concert hall or place of entertainment where wines or spirituous or malt liquors are sold or given away, or with which any place for the sale of wines or spirituous or malt liquors is directly or indirectly connected by any passageway, or entrance, who shall allow, suffer or permit boys under the age of sixteen years, or girls under seventeen, to congregate at, in or about, or frequent or visit such dance hall, concert hall or place of entertainment, shall be fined in any sum not exceeding \$500, to which may be added imprisonment not to exceed six months.

New temperance legislation was passed.

The power of juvenile courts was enlarged.

LABORATORY WORK.

The Secretary, at his own expense, examined twenty-seven samples of sputum: Eight of which were negative; nineteen of which were positive.

Forty-one diphtheria cultures: Twenty-eight of which were positive; thirteen of which were negative.

Twelve water analyses: Eight of which were condemned; four of which were potable.

VISITS.

Visits were made as follows:

January 1st, Loogootee and Salem, on account of conference with local authorities and inspection of schoolhouse.

January 21st, Colfax, on account of smallpox.

January 25th, Lafayette, to lecture before the corn school.

February 8th, Arcadia, to lecture before the Hamilton County Farmers' Institute.

March 20th, Princeton and Oakland City, to confer with local authorities in regard to sanitary matters and to inspect schools.

March 30th, New Palestine and Fairland, on account of smallpox. Detailed accounts of these visits are appended.

LOOGOOTEE AND SALEM.

On January 1st I visited Salem upon request of the county health officer and the county health board. These authorities wanted advice in regard to smallpox and in regard to the sanitation of schoolhouses. Upon arrival at Salem I met with the county board, and we discussed the subjects named above. We also visited some schoolhouses and further considered drainage matters. In the forenoon I gave a lecture before the high school students upon personal hygiene, and in the afternoon I addressed the county medical society.

On January 2d I went to Loogootee on account of request of Mayor Penrod, to inspect the school and give advice in regard to the sanitary needs of the place. I found the schoolhouse old and dilapidated, heated by ordinary stoves, insufficiently lighted and in every way unsanitary. I recommended the condemnation of this schoolhouse. The authorities of the town and most of the citizens will gladly welcome such condemnation.

Sanitary Survey of Schoolhouse at Loogootee.—This is a brick building, with six rooms, no cellar, box stairways, open holes in foundation. The building is cracked and dilapidated.

High School Room.— $24 \times 33 \times 12\frac{1}{2}$; twenty-nine seats; windows on three sides, furnishing insufficiently lighted area. Floor badly worn and unsafe.

Room No. 4.—Sixth, Seventh and Eighth Grades. $30 \times 50 \times 12\frac{1}{2}$; sixty seats; eight windows, three on each side and two at rear. Light was plenty, but not properly introduced. Floor old and patched.

Room No. 1.—First and Second Grades. $30 \times 24 \times 12\frac{1}{2}$; sixty-four seats; attendance date of visit, 47; five windows, giving plenty of light, but improperly introduced. Floor worn.

Room No. 2.—Third Grade. $30 \times 24 \times 12\frac{1}{2}$; fifty-seven seats; five windows, light improperly introduced. Floor old.

Room No. 3. Fourth and Fifth Grades. $30 \times 50 \times 12\frac{1}{2}$; fifty seats; insufficiently lighted. Old floors. Cracked walls.

First Primary.— $15 \times 30 \times 12$. Forty seats. This is a little, old, one-story frame shanty, and not connected with the main schoolhouse. There were holes in the floor, and children were compelled to sit looking into the light.

Summary.—All the rooms were heated by stoves, the air was bad in every one of them, the average attendance low, and in every room coughs, colds and more or less sickness existed. In room No. 1, First and Second Grades, the air was very bad. There were sixty-four little children in attendance. I took the temperature of eleven and found all of them standing above 100, with flushed faces and coated tongues, with coughs and colds.

Recommendations: I recommend the immediate condemnation of this schoolhouse, coupled with a command that it shall not be used for school purposes.

COLFAX.

On January 21st I visited Colfax, on account of an urgent telephone from the mayor, who reported the existence of many cases of smallpox, the resignation of the health officer on account of misunderstanding with the town board, and because the new health officer appointed had declared the disease not to be smallpox. Upon arrival I called upon the new health officer, Thomas G.

Webster, and with him visited twelve families, and found them all smitten with smallpox. He declared that typical cases of smallpox were not smallpox, but would not give the disease a name. He was unprotected with rubber suit, as directed in the rules, and persisted in handling the patients, and took no precautions to cleanse or disinfect himself. I therefore placed him under quarantine in his house for fifteen days, which quarantine was rigidly maintained. He was vaccinated, which vaccination took properly. It is to be noted that he did not develop the disease. The situation being very acute and the matter being considered with the mayor and town council, I telephoned to Dr. Cook, Vice-President of the Board (Dr. Wishard being absent in Cuba), and consulted with him as to taking sanitary charge of the town, as the law commands. The mayor and council were agreed, and so Dr. Nelson Brayton was appointed deputy, and instructed to maintain quarantine, make diagnoses, make vaccinations, and do all that was necessary to suppress smallpox. Dr. Brayton remained in Colfax for fifteen days, and the authorities promptly paid him according to their contract. Dr. Brayton's sanitary administration was exceedingly satisfactory, and the epidemic, which threatened to cover the city, was stayed.

LAFAYETTE.

On January 25th I went to Lafayette to deliver a lecture before the corn school. The corn school is a name given to a meeting which the farmers hold annually in the agricultural department of Purdue University, and which attracts from three to four hundred visitors. My lecture was illustrated with lantern slides, and kindly received, for unanimous resolutions of thanks were passed by the members. I was gratified after the lecture to answer as best I could numerous sanitary questions propounded by the farmers.

ARCADIA.

February 8th I went to Arcadia to lecture before the Hamilton County Farmers' Institute. The subject discussed was "The Usual Manner of Farm Sanitation." There was a large audience, and a unanimous vote of thanks was given.

PRINCETON AND OAKLAND CITY.

On March 20th I visited Princeton and Oakland City, upon invitation of the authorities of the two places, in order to confer in regard to drainage, schools and general sanitary matters. At Princeton I met the mayor and city attorney, and inspected the water supply, also the needs of the city for sewers, offered advice and suggestions. I also visited the public school building, and gave a talk before the high school students in regard to sanitary science and the work of the State Board of Health.

At Oakland City I met the town board and several physicians, and we had a conference in regard to drainage and the present water supply. The schoolhouse was also inspected, and address was made to the high school students, and recommendations as to improvements and ventilation were made. Oakland City has a water supply which is very interesting. An artificial lake was formed by throwing a dam across one end of a small valley which has a water shed of perhaps 200 acres. Gradually water accumulated, and now furnishes the supply of the town. Their inspection discovered free sources of possible pollution on the water shed. These were ordinary farm privies, and their immediate removal was recommended. The authorities were also strongly urged to acquire the entire water shed of their artificial lake, so as to preclude the possibility of pollution in the future.

NEW PALESTINE.

Various farmers south of New Palestine, in Shelby County, called at this office and requested a visit, on account of smallpox in their neighborhood. On March 30th I went to Fairland by trolley, and from there rode north through the country, visiting eight houses in all, and finally landing at New Palestine, from which point I returned home. At seven of the houses visited I found smallpox. In four of them very severe cases existed, and in the others the cases were mild. In all, 17 cases were diagnosed. Certain physicians in the neighborhood had insisted there was no smallpox, while others insisted the disease was smallpox. I established quarantine at every affected house visited, declared officially that the disease was smallpox, recommended vaccination, and upon return sent a supply of disinfectant.

LOOGOOTEE SCHOOLHOUSE.

The report of the Secretary concerning the unsanitary schoolhouse at Loogootee was considered and the following order of condemnation passed:

ORDER OF CONDEMNATION OF THE SCHOOLHOUSE AT
LOOGOOTEE, INDIANA.

Whereas, It has been shown that the schoolhouse at Loogootee, Martin County, Indiana, is dilapidated and in all other particulars unsanitary, and as the school records show a low general attendance on account of sickness, and inspection discovers that cough, colds, catarrh, headaches, indigestion, nervous strain and other ills due to unsanitary environment exist among the pupils, thus retarding them in their studies, and injuring them in health, therefore it is

Ordered, That the said schoolhouse at Loogootee is condemned for school purposes, and notice is hereby given to the school trustees of Loogootee, namely, J. B. Erwin, J. B. Padgett and H. Q. Rogers, that the present school building at Loogootee is condemned and shall not be used for school purposes after July 1, 1905, and it is further

Ordered, That prompt prosecution according to law shall be made by the Attorney-General against each of the school trustees of Loogootee if they permit school to be held after July 1, 1905, in the present condemned school building.

Passed in regular session April 7, 1905.

LABORATORY OF HYGIENE.

After considering the law and discussing the matter fully, the following action was taken:

Ordered first, The Secretary shall inquire into the fitness of persons to fill the positions of pathologist and bacteriologist, of assistant to the pathologist and bacteriologist, of chemist and of assistant to the chemist, and of deputy inspector of foods and drugs, and to select from the applicants the persons who, in his judgment, are best fitted to fill these positions.

Ordered second, When the Secretary has made his selections he shall present his nominations to the Board for consideration and action.

Ordered third, The salary of the superintendent of the laboratory, who is the pathologist and bacteriologist, shall be \$1,800 per annum; the salary of the chemist shall be \$1,400 per annum, and the salaries of the respective assistants shall be \$720 each per annum.

Ordered fourth, The deputy State inspector of foods and drugs shall have a salary of \$900 per annum.

Ordered fifth, The duties of the deputy State inspector of foods and drugs shall be to make such inspections and reports, and collect such samples of foods and drugs as may be required by the State inspector of foods and drugs, and also to perform such other duties as may be directed by the Secretary of the State Board of Health.

Ordered sixth, The Secretary is authorized to secure from the Custodian the assignment of a room in the State House, to be used as a bacteriological and pathological laboratory, and he shall supply the same with such furniture, plumbing and gas fitting as may in his judgment be necessary, and he shall likewise fit out basement room No. 10 as a chemical laboratory. He shall also make out a list of apparatus and books which are needed for the two laboratories, and secure bids from at least three dealers upon the same, the said bids to be opened by the Board at such time as may be appointed.

Ordered, The delegate to attend the conference with the Surgeon-General of the United States Public Health and Marine Hospital, session to be held in Washington, D. C., May 16, 1905, shall be the Secretary; and delegates to represent this Board to the annual meeting of the conference of State and Provincial Boards of Health of North America, to be held at Washington, D. C., shall be Drs. Eisenbeiss and Hurty. In the event that Dr. Eisenbeiss can not attend, then some other member may be delegate in his stead.

Ordered, The annual health officers' school for county and city health officers shall be held May 25-26, 1905, in Indianapolis, and the Secretary is authorized to secure teachers, make up a program, and make all arrangements.

Ordered, After due consideration, it is ordered that Dr. M. M. Haas, of Evansville, is elected to succeed himself as a member of the Indiana State Board of Dental Examiners, his term to be for two years, beginning June 1, 1905.

Ordered, Hereafter all bills, excepting those for salaries and clerk hire, shall be submitted to the President at least three days prior to the meeting of the Board at which they are to be considered.

Ordered, That the money paid to the Board by E. E. York, superintendent of the Indiana Boys' School, in lieu of returning antitoxin loaned, shall be expended for antitoxin, and due record made.

Ordered, A special meeting to consider blank forms for application for marriage license, and to consider the matter of examining plumbers, shall be held Monday, April 10, 1905, at 3 p. m., in the Board rooms at Indianapolis.

SPECIAL MEETING.

April 10, 1905.

Called to consider and pass upon forms of application for marriage license.

Called to order at 3 p. m. by President Wishard.

Present: Drs. Wishard, Cook, Eisenbeiss, Davis, Hurty.

Ordered, If found necessary on account of the inability of Drs. McFarland and Egbert to come to Indianapolis on May 25th-26th, then the Secretary is authorized to change the date of holding the health officers' school to June 1st-2d.

FORMS OF APPLICATION FOR MARRIAGE LICENSE.

After due consideration, the following forms of application for marriage license were adopted:

Application for Marriage License.—Male.

By

.....

.....

Acts, 1905. Sec. 6. Whoever procures the issuance of a license to marry by any false statement, representation or pretense, shall be fined in any sum not exceeding five hundred dollars.

Filed, 19....

.....

Clerk.

Official form of application for marriage license as determined by the State Board of Health according to Chapter 126 of the Acts of the Sixty-fourth General Assembly:

Application for Marriage License.—Male.

Application is hereby made for a license for the marriage of

..... to
Upon the following statement of fact relative to said parties:

1. The full christian and surname of the man is
2. Color 3. Where born
(Town, county, State or country.)
4. When born
(Day, month and year.)
5. Present residence
6. Present occupation
7. If no occupation, what means has the male contracting party to support a family?.....
8. Is the male contracting party of nearer blood kin to the female contracting party than second cousin?.....
9. Full christian and surname of father.
10. His color..... 11. His birthplace.....
12. His occupation..... 13. His residence.....
14. Full christian and maiden name of mother
15. Her color 16. Her occupation.....
17. Her birthplace..... 18. Her residence.....
19. Has the male contracting party been an inmate of any county asylum or home for indigent persons within the last five years?
.....
20. If so, is he now able to support a family and likely to so continue?
.....
21. Is this his first marriage?.....
22. If not, how often has he been married?.....
23. Has such prior marriage or marriages been dissolved?.....
24. If so, how? 25. When?
26. Is the male contracting party afflicted with epilepsy, tuberculosis, venereal or any other contagious or transmissible disease?
.....
27. Is he an imbecile, feeble-minded, idiotic or insane, or is he under guardianship as a person of unsound mind?.....
Signature of applicant

State of Indiana, County, ss:

..... deposes and says that
has personal knowledge of the facts above stated and that they and each of them are true.
.....

Subscribed and sworn to before me, this
day of, 19.....

.....
Clerk.

.....
Circuit Court.

Application for Marriage License.—Female.

By

, 19.....

Acts, 1905. Sec. 6. Whoever procures the issuance of a license to marry by any false statement representation or pretense, shall be fined in any sum not exceeding five hundred dollars.

Filed 19.....

Clerk.

Ordered, The State Board will meet Monday, June 12th, 1905, at 3 p. m., to consider rules governing the sanitation of railway coaches and trolley cars, and the Secretary is directed to invite all railroad and trolley car companies to send representatives to advise upon the matter, to the end that all rules adopted may be as practical as possible.

The letter of Dr. John N. Taylor concerning the examining of plumbers who may voluntarily apply for examination, was received, but no action taken.

By Dr. Davis:

Resolved, By the State Board of Health, that in its opinion, the marshes and wet lands produced by the drainage of Bruce Lake, in Fulton County, with a small arm extending into Pulaski County, during certain seasons of the year are a menace to the public health of that locality and are hereby declared a public nuisance. We recommend the restoration of the lake.

SPECIAL MEETING.

June 1, 1905.

Present: Drs. Davis, Eisenbeiss, Tucker and Hurty.

President Davis called the meeting to order at 12:30, and stated the object of the special meeting was to receive nominations from the Secretary for the positions of bacteriologist, assistant bacteriologist, and head chemist and assistant for the State Laboratory of Hygiene; also, transact any other business that might seem necessary.

The Secretary nominated Dr. T. Victor Keene for the position of superintendent of laboratory and bacteriologist. Seconded by Dr. Eisenbeiss, and unanimously carried.

The Secretary nominated Prof. H. E. Barnard, of Concord, N. H., for the position of chief chemist. The nomination was seconded by Dr. Tucker, and the election was unanimous.

The Secretary nominated Mr. Harry E. Bishop for the position of assistant chemist. Dr. Tucker seconded the nomination, and Mr. Bishop was unanimously elected. There were no nominations made for assistant bacteriologist, and the filling of this position was left for the future.

Dr. Tucker introduced the following resolution:

Resolved, That the salary of the chief chemist shall be \$1,500 per annum and that all conflicting resolutions are repealed.

Carried.

The Secretary then presented sanitary surveys of the schoolhouses at Hope, Bartholomew County, Indiana; Coatesville, Hendricks County, Indiana; Sharpsville, Tipton County, Indiana. These surveys are herewith recorded:

SANITARY SURVEY OF SCHOOLHOUSE AT HOPE, IND.

Upon invitation of the school authorities of Hope, Ind., who desired the advice of the State Board of Health, I visited the above-mentioned town and made sanitary survey of the schoolhouse. I was accompanied by County Health Officer Kincaid. On arrival at Hope, we met all of the three trustees and together visited the schoolhouse.

Sanitary Survey.—The site is very satisfactory—indeed, beautiful and quite ideal. The present schoolhouse is brick, built originally in 1878 and added to in 1890 and repaired. It has no basement, but is built flat upon the ground. At one place a shallow cellar was dug under the building after it was completed and a furnace installed.

There are six rooms, three on the ground floor and three above. As just said, the building is heated by furnace, but, because of inefficiency, the north side rooms have stoves in them. The furnace takes air from the outside, but there are no adequate ducts for taking the bad air out of the rooms.

Room No. 1.—This room is 33x21x14; total, 9,702 cubic feet. There are 54 seats, and there is therefore assured to each student 180 cubic feet of space, which is sufficient. The floor is old and worn. The room is lighted by four windows on the east side and two on the north. The blackboards and the seats are satisfactory.

Room No. 2.—This room is 24x32x12, giving a total of 9,216 cubic feet. There are 48 seats, and this gives almost 200 cubic feet of space to each child, which is sufficient. It is lighted by six windows, three on each side. The floor is in only passable condition, and the paper torn and hanging from the walls.

Room No. 3.—This room is 33x21x14, giving a total of 9,702 cubic feet. There are 51 seats, and there is therefore over 180 cubic feet of space to each pupil, which is sufficient. It is lighted by four windows on the west and two on the north. Floors are old and worn. The seats and blackboards are satisfactory.

SECOND STORY.

Room No. 4.—This room is 33x21x16, making a total of 11,088 cubic feet, which furnishes ample space for the 44 pupils. It is lighted by six windows, four on the east and two on the north side. The floor is worn, but the blackboards and seats are satisfactory.

Room No. 5.—This room is 24x32x12, and contains 9,216 cubic feet. This gives ample cubic space for the 40 pupils it contains. It is lighted by six windows, three on the east and three on the west. The floor is in good condition, and also the walls. The desks and blackboards are satisfactory.

Room No. 6.—This room is 33x21x16, and contains 11,088 cubic feet. This furnishes ample cubic space for the 37 pupils it accom-

modates. Floor is bad and walls cracked. It is lighted by six windows, four on the west and two on the north. Seats and blackboards are satisfactory.

Outhouses.—Outhouses are of the ordinary kind, widely separated, and have been kept in passable condition.

Drinking Water.—Drinking water is furnished from two drilled wells, and is doubtless satisfactory.

Remarks.—As before said, the building is heated by a furnace, which was installed after completion by digging under shallow cellar. This furnace is too small for the building, and at the present time is entirely burned out. Its top came so close to the floor above that it made the floor so hot that it was said, "one could not hold a hand upon it." Once the house caught fire. The stairway to the second floor is narrow, boxed, and has one turn. If the schoolhouse had ever caught fire when school was in session, the loss of life would have been very great. There is a strong demand in the community for a new building, but of course opposition exists. It would be agreeable to the trustees and many of the best citizens if the schoolhouse were condemned, for then there would be no further difficulty in securing a new one. As the building is dangerous, is old, rather dilapidated, and is not properly lighted and ventilated, I therefore recommend its condemnation.

INSPECTION OF SCHOOLHOUSE.

State Board of Health:

Gentlemen—Pursuant to instructions from Dr. J. N. Hurty, I made an inspection of the schoolhouse at Coatesville, Hendricks County, May 18, 1905.

The town is situated on high, rolling ground, has a population of about 650 to 700, and a school enumeration of 230 to 240.

The school building is in the northeast part of the village, one block from any street, and the pupils have to traverse alleys filled with rubbish, stable manure, etc., and in rainy weather, mud, to reach the building. The building is a two-story, four-room brick, with shingle roof, built about twenty-four years ago. The lot contains about one acre of ground and is high and dry. The dug well is about 75 feet east of the building, has an old wooden pump in it and a small platform over it. There is no drain to carry off the waste water which stands around in pools and slowly finds its way back into the well. The closets are in opposite corners on the north side of the yard, with screens in front of them. There are no walks about the premises. The doors to the entrance hall are large, heavy barn doors hung on rollers, which run on an iron bar or track, fastened above the entrance and are slid back and forward. There is a good stairway leading to the upper floor.

The rooms are about 26 feet square, are papered and have blinds, and the lower rooms have strong wire screens outside the windows. The floors are well worn but have no holes in them and have been oiled and kept clean.

The blackboards are of wood painted black. Seats are old but in fair condition. The ceiling in the west room down stairs is beginning to crack badly in the center, and in the upper rooms the paper is beginning to scale off on the south sides of ceilings and rooms on account of the roof leaking.

The village boys had broken most of the glass in the upper windows. The casing of the windows was in fair condition with the exception of the upper hall window, which had to be braced to keep it from falling into the hall. The rooms were heated by large coal stoves. There is no ventilation except by the windows.

The walls are in fair shape except the east one, which is cracking badly and beginning to bulge outward between the upper and lower windows. There is no basement. The yard is not fenced. The alley principally used for ingress to the schoolhouse runs west from the south-west corner of the yard to the street, and adjoining the yard on the west is a barnyard. On the west side of the barnyard and just across the fence is a small stable and three water closets, the contents of which seem to be overflowing and running down a shallow gutter or depression in the ground across the alley and down the west side of an alley which opens into it from the south.

The building is old, unsanitary and not worth the cost of repairing. It is so situated that it is a menace to the health of the children who have to attend school, and I do most earnestly recommend its being condemned for school purposes.

The following circumstances, however, should be considered in connection with the case:

The trustee, Mr. W. E. Greenlee, informs me that the township is about \$20,000 in debt on account of building a new modern schoolhouse in the township last year to replace one that burned down, and that the special school tax is now 50 cents on the \$100, which is as high as they can go. He is anxious to have a new, modern, sanitary building, but does not see his way clear to raise the money for one. If the Board would condemn the building and allow him a year to arrange for building a new one, he would like to have it do so. The town is not incorporated, and has no health officer or deputy, but needs one very badly.

I would suggest to your Board that Dr. Hoadley be requested to appoint Dr. Luther Williams as health officer for the town. Dr. Williams accompanied us on the inspection and told me he would accept the position if appointed.

Very respectfully,

J. L. ANDERSON,

Deputy State Sanitary Inspector.

INSPECTION OF SCHOOLHOUSES.

State Board of Health:

Gentlemen—Pursuant to instructions from Dr. J. N. Hurty, I visited Sharpsville, Tipton County, Ind., May 18th, and inspected the school building at that place.

Sharpsville has a population of about 750, and there are 190 pupils enrolled in the school, with an average attendance of about 180.

The school building is a two-story, four-room, tiled-roof building, built in 1891. The ground comprises one block, is covered with fine shade trees and is high and dry. What walks there are, are made of gravel. The water closets are of brick with dug vaults, with a screen in front of girls' closet. The well is on the northeast corner of the lot and is deep driven, with a good iron pump in it, and is covered with a small frame house. There is a cloak room to each of the schoolrooms, provided with plenty of hooks for the children's wraps. The schoolrooms are about 22x34 feet, heated by stoves and ventilated by the windows. There is an opening into the chimneys back of the stoves and near the floor for foul air to escape, but none above for fresh air to enter. The walls are papered, blinds to all windows, and the floors are in good condition. The plastering in the upper rooms has separated where the walls and ceiling join, leaving wide cracks. The desks and furniture are in good condition. The rooms are overcrowded, as there are three school districts combined in this building. I counted 76 seats in one room. The trustee, Mr. G. W. Herron, informed me that he could add three more districts to this school, if he had the room, and that it would be an economy to the township to do so. The building is so constructed that it can not be built to or remodeled without great expense and he does not think the result would justify him in incurring it. The township is out of debt, but there is no money in the treasury with which to build at this time.

The surroundings are such that a good, modern, sanitary building, with flush closets in basement, and all necessary conveniences could be erected at a reasonable cost, and, in view of the fact that more room is imperative, he would prefer to put the money it would cost to make the changes into a new building.

I would recommend that this building be condemned on account of unsanitary construction, but that time be allowed the trustee to make his financial arrangements.

Very respectfully,

J. L. ANDERSON,

Deputy State Sanitary Inspector.

After due and full consideration of the above sanitary surveys, formal condemnation of the schoolhouses was ordered and the following proclamations adopted:

**PROCLAMATION CONDEMNING THE SCHOOLHOUSE AT HOPE,
BARTHOLOMEW COUNTY.**

Whereas, It is shown to the satisfaction of the Indiana State Board of Health in session June 1, 1905, that the schoolhouse at Hope, Bartholomew County, Indiana, is unsanitary and unsafe on account of defective heating apparatus, therefore it is

Ordered, That said schoolhouse is condemned for school uses, and the Hope school authorities are commanded not to use it for school purposes after November 1, 1905.

Violation of this order will be promptly followed with prosecution by the Attorney-General of the State, according to the statutes made and provided.

Passed June 1, 1905.

**PROCLAMATION CONDEMNING THE SCHOOLHOUSE AT COATES-
VILLE, HENDRICKS COUNTY.**

Whereas, It is shown to the satisfaction of the Indiana State Board of Health in session June 1, 1905, that the schoolhouse at Coatesville, Hendricks County, Indiana, is unsanitary, therefore, it is

Ordered, That the said schoolhouse is condemned for school uses, and the school authorities having control are commanded not to use it for school purposes after November 1, 1905.

Violation of this order will be promptly followed with prosecution by the Attorney-General of the State according to the statutes made and provided.

Passed June 1, 1905.

**PROCLAMATION CONDEMNING THE SCHOOLHOUSE AT SHARPS-
VILLE, TIPTON COUNTY.**

Whereas, It has been proven to the satisfaction of the Indiana State Board of Health in session June 1, 1905, that the schoolhouse at Sharpsville, Tipton County, Indiana, is unsanitary, therefore, it is

Ordered, That the said Sharpsville schoolhouse is condemned for school purposes, and the school authorities having control of said Sharpsville schoolhouse are commanded not to use the said schoolhouse for school purposes after November 1, 1905.

Violation of this order will be promptly followed with prosecution by the Attorney-General of the State according to the statutes made and provided.

Passed June 1, 1905.

J. T. POLK & CO., GREENWOOD.

Application for renewal of J. T. Polk Company's permit to discharge impounded factory washings into an adjoining unnamed creek was considered and permit was ordered issued, as follows:

PERMIT TO DISCHARGE REFUSE INTO A CREEK.

Whereas, The J. T. Polk Company, a corporation organized under the law, and operating a canning and preserving plant at Greenwood, Johnson County, Indiana, has filed with the Secretary of the State Board of Health its verified voucher and application in writing, asking for a permit to discharge into a small stream in said State, and said stream having no name, certain waste waters, from its plant, and showing in such application that said stream at times is very high and filled from bank to bank, and that when in this condition, the said waste water might be safely discharged into said stream without injury to the public, and,

Whereas, Said Board of Health has duly inspected said stream at and below point of proposed discharge of refuse from the factory and has found and finds that said waste water is harmless and unpolluted and may, when the water is at a high stage, be discharged into said unnamed stream without injury as aforesaid, now, therefore, said Board of Health thereby grants and issues its written permit hereby granting permission to said J. T. Polk Company at Greenwood, Johnson County, Ind., to flow and discharge waste water from its storage pond into the nearby and unnamed creek when said creek is at high flood, and not then except by permission of the local, county or State health officer.

This permit is given this day, June 1, 1905, by the State Board of Health, and becomes null and void the 31st day of December, 1905.

Adjourned to meet in second session at 12 m., June 2d.

ADJOURNED MEETING.

According to adjournment of June 1st, the State Board of Health met at 12 m., June 2d.

President Davis called the meeting to order and asked the Secretary to present all matters demanding action.

Secretary stated there was nothing to be attended to except the allowance of bills incident to the meeting of the State Board of Health and the health officers' school.

THIRD QUARTER.

Regular Meeting.

REGULAR QUARTERLY MEETING.

Third quarter of the calendar year, fourth quarter of the fiscal year.

The affairs of the third quarter of the fiscal year were considered.

Present: Drs. Davis, Eisenbeiss, Tucker and Hurty.

Minutes of the last regular and of the special meetings held April 7th, April 10th and June 1st, respectively, were read and approved.

Secretary's report for quarter read as follows:

REPORT OF SECRETARY FOR QUARTER.

The most important event of the quarter was the annual health officers' school, which was held June 1st and 2d. Only county and city health officers were summoned to this school. One hundred and forty-seven attended.

The teachers were Drs. McFarland and Egbert, from Philadelphia; Drs. Davis, Bond and Grant and Professor Sackett, all of Richmond. The teachers from Indianapolis were Drs. Keene, Brayton and Dodds.

Five sessions were held, the attendance being first class and the interest was very good. The meeting was disappointed in not being addressed by Governor J. Frank Hanly. Mayor Holtzman, being sick, sent the city attorney to deliver an address of welcome. The papers were all of the very highest class, and there was a general demand among the officers that the same be printed in pamphlet form. The Secretary recommends that an order be given authorizing the publishing of these papers.

During the quarter the Secretary has had examined at his own expense 17 sputums, 12 being positive; 22 diphtheria cultures, 16 being positive, and 7 samples of water, all of them polluted and duly condemned.

VISITS AND INSPECTIONS.

Five visits and inspections were made during the quarter, as follows:

April 25th, Brazil, account of inspection of poorhouse.

May 13th, Washington, D. C., to attend the annual conference of State Boards of Health with Surgeon-General Wyman, of United States Public Health and Hospital Service, held May 15th; to attend the annual conference of the State and Provincial Boards of Health of North America, held May 16th and 17th; to attend the first annual meeting of the National Association for the Study and Prevention of Tuberculosis, held May 18th and 19th.

May 26th, Hepe, Bartholomew County, to inspect the school-house.

June 21st, Connersville, account of smallpox.

June 29th, Columbus, account of smallpox.

Detailed accounts of all of these visits are herewith appended.

BRAZIL.

The county health officer of Clay County, Dr. L. L. Williams, on the order of his county board of health, sent a special letter to request that the sanitary condition of the poorhouse of Clay County be inspected and recommendations made. Accordingly, April 24th, with Mr. Amos Butler, Secretary of the State Board of Charities, I visited the county poorhouse. We found the building old, very unsanitary, and no provision made for the separation of the sexes.

Much sickness had prevailed among the inmates, owing to the overcrowding and the unsanitary conditions. The food was plentiful, abundant and of good quality. A detailed survey of the building and entire premises was taken by Mr. Butler for his report. It seemed unnecessary to give same here. The Secretary of Health, Mr. Butler in saying that a new building must be erected, was correct and sanitary in every particular.

WASHINGTON, D. C.

ANNUAL CONFERENCE OF HEALTH WITH SURGEON-GENERAL WYMAN.

At the annual conference, twenty-six States and Territories were represented, May 15th. Each delegate

presented a typewritten report of all health laws and rules passed, and of all new sanitary work of their boards since the last meeting. Only two sanitary subjects of national interest were discussed. No papers were read.

The first subject was, "Should a National Sanatorium for Lepers Be Established?" The statistics gathered by General Wyman showed there are lepers in twelve or fifteen States. In Minnesota lepers are cared for in the county poor farm; in Louisiana there is a lepers' home, but only a small proportion are cared for at that place. Massachusetts has several lepers, which are cared for in the community in which they are found. A resolution was passed that a national lepers' home was very necessary. Dr. Victor Vaughan was very emphatic in expressing his belief that a national home should be provided.

The second subject was "The Control of Typhoid Fever." The discussion developed nothing new and brought forth no resolutions.

CONFERENCE OF STATE AND PROVINCIAL BOARDS OF HEALTH OF NORTH AMERICA.

This conference was held in Washington on Tuesday and Wednesday, May 16th and 17th, following the conference with General Wyman. President Dr. John S. Fulton, secretary of the State Board of Health of Maryland, gave in his address a review of the work of several State boards of health during the last year. A notable report was made by the committee on "The Control of Venereal Diseases." A committee appointed one year ago presented a report upon the advisability of the abandonment of isolation for the control of smallpox. Dr. H. M. Bracken, of Minnesota, chairman of the committee, recommended the complete abandonment of quarantine and isolation in the control of smallpox, and argued that the only rational and businesslike procedure was vaccination. He said: "If people will not vaccinate, they must, when smallpox is epidemic, have the disease." The resolution advocating the abandonment of quarantine presented by the committee was rejected, after a discussion of almost four hours. Finally strong resolutions were adopted, claiming that, while vaccination was the prophylaxis for smallpox, still intelligent quarantine was useful.

Sanitary management in Cuba was discussed, and resolutions commending health administration in that country were adopted.

Other subjects considered were in regard to registration of vital statistics, classification and tabulation of vital statistics, abating of local nuisances where local authorities were negligent.

Much interest was taken in discussing Indiana's new marriage law. Dr. T. Victor Keene, city sanitarian of Indianapolis, reported the importation of black smallpox from St. Louis. In this instance a dead body was allowed to be shipped from St. Louis on a permit giving cause of death as heart disease. At Indianapolis a large funeral was held, which was followed with an outbreak of smallpox, and this resulted in one death. The body was disinterred, and it was discovered without doubt that the death was caused from hemorrhagic smallpox.

By special favor of the Treasury Department, an excursion was given the members of the conference down the Potomac to Mt. Vernon in the revenue vessel "Windom."

NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS.

This association was organized in Atlantic City in 1904, at the time of the meeting of the American Medical Association.

Dr. Edward L. Trudeau, of Saranac Lake, N. Y., was made president, and Dr. William Osler and Dr. Herman Biggs, vice-presidents.

Fully 500 people were assembled in the auditorium of the Willard Hotel, at Washington, D. C., when the meeting was called to order at 11 a. m., May 18th. When Dr. Trudeau stepped forward on the platform to deliver his address a great ovation was paid him. The audience arose en masse and cheered lustily. As Dr. Welch afterward said, this was a fit recognition of great modesty and ability. Dr. Trudeau has not yet recovered from his illness of last spring. His voice was not strong and his hand trembled perceptibly. Dr. Osler delivered his address without manuscript, and he, too, received an ovation from the audience, against which he gently protested by raising his hand. Evidently he did not feel worthy of such high honor. Every word of his address could be heard in all parts of the room. He was specially happy in his figures of speech. He said: "The public is awake to the importance of the combat against tuberculosis. But she sits on the edge of the bed, not fully dressed, and not decided as to the work of the day." A glowing eulogy was paid to Dr. Trudeau, who first intro-

duced the systematic sanatorium treatment in the Central States as a cure and preventative of tuberculosis. From Dr. Osler's account, Dr. Trudeau met and overcame discouragements and difficulties which would have discouraged ten ordinary men.

Dr. Biggs' address dealt with the technical side of the cure and prevention of tuberculosis in the popular way. He spoke for a longer time than either of his predecessors, but every word was listened to with attention. These three addresses constituted the first session, from 11 a. m., Thursday, May 15th, until 1 p. m. At 2 p. m. the association was divided into two sections. The sociological section was presided over by Mr. Homer Folks, of New York, with Miss Lillian Brandt, of New York, as secretary. Dr. Norman Bridge, of California, was to act as chairman of the clinical and climatological section, but illness prevented his attendance, and Dr. Bonney, of Denver, acted as chairman pro tem. The sociological section was liberally attended by the women, while the clinical and climatological section was attended almost entirely by men.

Mr. Homer Folks presented a very powerful address, entitled, "Health as an Investment." Mr. Folks is the incarnation of health and vigor, with clearness of mind.

Dr. Edward T. Devine, the well-known national authority in sociology, followed Mr. Folks with a paper entitled, "A Working Program for Associations for the Prevention of Tuberculosis, National, State and Local." It is impossible at this time to review this admirable paper. It was discussed by Dr. Arnold C. Klebs, of Chicago; Mr. John M. Glenn, of Baltimore; Mr. John M. Wainwright, of Scranton. At the afternoon session the "Progress of the Sanitary Movement in America" was presented at length by Mr. William H. Baldwin, of Washington. The discussion was opened by Dr. W. J. Marceley, superintendent of the Massachusetts State Sanatorium for Consumptives. He was followed by Mr. Allen, of New York, and Mr. Danner, of Denver.

A paper entitled "Infection in Transportation" was read by Dr. H. M. Bracken, of St. Paul, secretary of the Minnesota State Board of Health. This paper excited wide discussion, and became so interesting that many of the audience were observed sitting on the edge of their chairs. Dr. Bracken very severely criticised the Pullman Company and several of the railroad companies of Minnesota. His criticisms were met by Dr. T. R. Crowder, superintendent

ent of sanitation, Pullman Company, and by Dr. J. B. Kaster, chief surgeon of the Santa Fe System.

As has been stated, the clinical and climatological section was more largely attended than the sociological, and more specially by men.

Dr. Vincent Y. Bowditch, of Boston, who is a trustee of the Massachusetts State Hospital, and who is superintendent of the Sharon Sanatorium, gave an address entitled, "Clinical Nomenclature." He had charts showing Tuburan's scheme for a method of comparative statistics for pulmonary tuberculosis. These charts were fully explained and their advantage discussed. Dr. Bowditch presented a plan for the classification of cases and the result of treatment in pulmonary tuberculosis, to be used in connection with Tuburan's scheme. The classification was as follows:

Progressive (Unimproved): All essential symptoms and signs unabated or increased.

Improved: Constitutional symptoms lessened or entirely absent; physical signs improved or unchanged; cough and expectoration with bacilli usually present.

Arrested: Absence of all constitutional symptoms; expectoration and bacilli may or may not be present; physical signs stationary or retrogressive; the foregoing conditions to have existed for at least two months.

Apparently Cured: All constitutional symptoms and expectoration with bacilli absent for a period of three months; the physical signs to be those of a healed lesion.

Cured: All constitutional symptoms and expectoration with bacilli absent for a period of two years under ordinary conditions of life.

For admission to the hospital Dr. Bowditch proposed four classes: (1) Incipient (favorable). (2) Moderately advanced. (3) Far advanced. (4) Acute miliary tuberculosis. Boundaries were stated for each of these four classes.

"The Importance of Early Diagnosis" was discussed by Klebs, Billings and Babcock, of Chicago, and by Musser, Wilson and Landis, of Philadelphia, and Osler, of Baltimore, and Janeway, of New York.

"The Role of Climate in the Management of Tuberculosis" was the title of a report of the special committee, and was read by Dr. C. L. Minor, of Asheville. In this report Dr. Minor insisted that climate was an important factor in the cure of tuberculosis. This was strenuously opposed by Dr. Flick, of Philadelphia. Dr. Flick was very emphatic in expressing the opinion that the cure of tuber-

culosis depended upon a method, and that method was "as applicable in one climate as another." Finally a resolution was adopted to the effect that climate was doubtless a factor in some degree with certain temperaments.

Dr. M. P. Ravenel, of Philadelphia, was chairman of the pathological and bacteriological section, which met Friday, May 19th, at 10 a. m. Dr. Wm. H. Welch, of Baltimore, delivered the introductory address upon "Channels of Infection in Tuberculosis." This was a notable address. Dr. Welch spoke without notes, and smoothly, like the finished scholar and orator he is. He showed himself exhaustively familiar with his subject. One conclusion was that the source of infection is from human beings, more than from a cow or other animals. Dr. Welch's power to hold an audience was shown in this address, for he talked a little over one hour, and not a person left the room. Dr. Arthur J. Richer, of Montreal, gave his experience in "The Therapeutic Value of Marmorek's Anti-Tubercular Serum." He detailed many experiences, showing charts and diagrams, and his conclusion was that no results upon which to base positive conclusions were secured.

Dr. G. Figari, of Genoa, by special invitation gave a lecture entitled, "The Natural and Artificial Protection of Man Against Tuberculosis." This gentleman was listened to with the deepest attention, for he was evidently a master of his subject. Although an Italian, he spoke English which was easily understood. It is impossible here to give even a brief summary of this address.

The Friday afternoon session of this section was extremely technical. Dr. Ravenel, the very enthusiastic and very successful investigator, gave an account of "The Diagnostic and Prognostic Value of Agglutination in Tuberculosis." And Drs. Flick and Walsh, of Philadelphia, together gave a paper entitled, "Vicarious Action of the Bowel for the Kidney in Tuberculosis."

On Friday forenoon, in general session, a symposium was heard on the "Sanatorium Treatment of Consumption, Cases Demanding Sanatorium Treatment Regardless of Climate." Various features of the sanatorium treatment was assigned to different discussants. The speakers were Dr. King and Nagle, of the Loomis Sanatorium; Dr. Foster, of New Haven; Drs. Clapp, Bowditch and Otis, of Boston; Major Bushnell, of Fort Bayard, and Drs. Trudeau and Knopf, of New York.

Pathological Exhibit.—A very extensive exhibit of pathological specimens was made by the Bureau of Animal Industry. An interesting specimen was a piece of a lung of a wild Philippine deer, showing tuberculosis. It was of extra interest because the wild animal must have lived in the open air continuously and must have lived a temperate life with this environment. Doubtless it had been subjected to the severest conditions possible to infection.

The Zoölogical Society of Philadelphia, also the Henry Phipps Institute, made extensive pathological exhibits. In the specimens shown by the Henry Phipps Institute were to be found those showing the careful experiments of Dr. Ravenel whereby he proved the transmission of tuberculosis to animals. A specimen proved that the initial lesion appeared in the lungs of a dog when the infection was introduced into the intestinal tract. Other specimens showed that lesions might appear in any of the organs or tissue upon the introduction of the infection in the stomach. Experiments completely overflow the conclusions of Koch presented at the London Tuberculosis Congress in 1901.

As a fitting windup of the convention, a dinner was given in honor of Dr. Trudeau. Dr. Wm. Welch, of Baltimore, presided, and in his opening remarks delivered a eulogy of Dr. Trudeau not second to that given by Dr. Osler in general session on the first day. Although Dr. Trudeau was not present, on account of the condition of his health, his letter showed he was there in spirit, and this fact was further evidenced by the fervor and enthusiasm of the banqueters in the cause against tuberculosis.

It is to be noted that several of the prominent gentlemen present were at one time attacked with tuberculosis, among them being Drs. Solly, Knight, Minor, Trudeau and Carrington. Professor Fisher, of Yale University, who cured himself by outdoor treatment, and who is the inventor of the Fisher tent, was present.

Dr. Herman Biggs, of New York, was elected president for the ensuing year.

HOPE.

On May 26th I visited Hope, and full report of this visit, with subsequent action of the State Board, will be found in the minutes of the special meeting held June 2d.

CONNERSVILLE.

June 21st I visited Connersville, on account of an urgent telephone message from the mayor and city health officer. Smallpox was reported in the city, and the doctors were disputing as to whether or not it was smallpox. Upon my arrival I found there had been several cases of an eruptive disease, and the case which I visited, a child twelve years old, proved to be chickenpox. Close examination of the patients, all of whom were now almost well, did not enable me to determine whether the disease had been smallpox or chickenpox. I took occasion to urge vaccination, and persons submitted.

COLUMBUS.

June 29th I visited Columbus on account of smallpox, being summoned by an urgent message from the city health officer. Upon arrival I found three cases of the disease, and there was much evidence to lead to the conclusion that many persons in that particular neighborhood had been attacked. A strict quarantine was established and a vaccination station opened. I vaccinated 41 persons myself, and before I left fully 100 had been attended to.

CONDEMNATION OF SCHOOLHOUSES.

Proclamations of condemnation of schoolhouses at Sharpsville, Coatesville and Hope were duly made out and forwarded, as per the order of the Board at its special meeting June 2d.

STATE LABORATORY OF HYGIENE.

Room No. 19, in the basement, has been secured for the chemical department of the State Laboratory of Hygiene. The custodian has not assigned a room for the bacteriological department. Lists for apparatus for the laboratory were sent to E. H. Sargent, Chicago; Eimer & Amend, New York; Bausch & Lomb, Rochester, N. Y. According to the orders of the Board, Dr. Tucker and the Secretary met at the office of the Board and carefully went over the bids, together with Dr. Keene, and finally awarded the order for apparatus to E. H. Sargent & Co., this firm making a bid lower than the others. The order for heavy chemicals was awarded to Baker & Adamson, Easton, Pa.; the order for platinum to Baker

& Co., of Newark, N. J. The order for chemical apparatus to be ordered abroad, duty free, was awarded to Bausch & Lomb, and the order for chemicals and reagents was awarded to Eimer & Amend. All of the bids are on file, and it will be found that these awards were in each instance given to the lowest and most advantageous bidder.

Ordered, The Secretary's report shall be accepted and spread of record.

SHARPSVILLE SCHOOLHOUSE.

The following communication was read from Trustee George W. Herron, concerning the schoolhouse at Sharpsville, which was condemned at the last regular meeting of the board.

The condemnation was regularly served upon the trustee at Sharpsville by Dr. Gifford, county health officer of Tipton County. On Monday, July 3d, Mr. G. W. Herron, trustee of Liberty Township, called at the office and made the following statement, to wit:

As trustee and as representing the advisory board of my township, I respectfully request that the condemnation of the Sharpsville schoolhouse be extended for a period of two years, for the following reasons: Our financial condition will not admit of our building a new schoolhouse. We are not taxed to the limit, but the tax conditions are such that we can not make a levy sufficient to build the kind of a schoolhouse which should be constructed. We desire very greatly to have a sanitary schoolhouse of ample size, but if forced to build on the small amount of money which can now be constitutionally raised, we can not have such a building as we desire. As trustee, I promise to put sheet-iron jackets around the stoves and put ventilators in the windows such as described by Secretary Hurty. Respectfully requesting your consideration of this proposition and awaiting your reply, I am

Respectfully yours,

GEORGE W. HERRON.

After discussion it was

Ordered, The condemnation of the Sharpsville schoolhouse shall be amended to forbid the use of the same for school purposes after November 1, 1907: Provided, The trustee places a galvanized jacket around the stove and places ventilators in the windows, according to the directions of the State health officer.

KNIGHTSTOWN PAPER COMPANY.

State of Indiana, County of Henry:

Comes now Samuel Pritchard, and represents to the State Board of Health that he and one David Monticue, under the firm name of Manticue

& Pritchard, are the lessees of the Knightstown Paper Company of its paper mills near Knightstown, Indiana, and are engaged in the manufacture of paper from straw and other materials, and as such firm hereby asks permission to be allowed to discharge into Montgomery Creek, a running stream of water near said mill, the waste water and other refuse from said establishment. That said waste water and refuse can safely be discharged into said stream without injury to the public or to any individual. That the water of said stream is at such stage as that such refuse and waste water can be discharged into said stream without affecting any person or property. Samuel Pritchard on his oath says that the facts stated in the foregoing statement are true as he verily believes.

SAMUEL PRITCHARD.

Subscribed and sworn to before me this 18th day of May, 1905.

FLOYD J. NEWBY,

Notary Public.

My commission expires October 6, 1907.

The above communication was fully discussed, and it was
Ordered, Permit as asked for is allowed, the same to expire
January 1, 1906, and to read as follows:

Whereas, The Knightstown Strawboard Company, a corporation of the State of Indiana, has heretofore filed with the Secretary of the State Board of Health of said State, its verified application in writing, asking permission to be allowed to discharge into a stream in said State, known as Montgomery Creek, certain waste water from the manufacturing establishment of said corporation, operated in the manufacture of strawboard, and situated near the city of Knightstown, in Henry County, in said State, showing in such application that said stream was, at the time of filing and making said application, at such a stage as that such waste water might be safely discharged into said stream without injury to the public, and,

Whereas, Said State Board of Health has duly inspected said stream at and below the point of such proposed discharge and has found and finds that such waste water may, for the period hereinbelow fixed, be safely discharged into said stream without injury as aforesaid. Now, therefore, said State Board of Health hereby grants and issues this, its written permit, hereby granting permission to said strawboard company, to flow and discharge the waste water from said manufacturing establishment into said stream for a period extending from the date hereof, to the first of January, 1906.

Provided, That said waste water shall be flowed, or discharged into said stream only after it has passed through a settling pond or ponds, and through at least two feet of gravel, which gravel is to overlie porous tile laid in ditches, sufficient ditching and tiling being provided to filter all the waste water discharged into Montgomery Creek.

This permit is given this day, July 7, 1905, by the State Board of Health, four members being present and concurring.

CAR SANITATION.

The following rules and recommendations were read and considered by numbers, and lastly considered as a whole:

Rule 1. Steam Railway Coaches. Day coaches shall be thoroughly cleaned at the end of each trip, and in no instance shall a day coach go uncleaned longer than two days. The thorough cleaning of day coaches shall consist as follows: (a) Windows and doors shall first be opened and the aisle strip, if there be any, removed from the car; (b) all upholstering dusted and brushed; (c) floor mopped or swept after it has been sprinkled with water, to which may be added an approved disinfectant; (d) after cleaning, as in (c), the floor should be scrubbed with soap and water, to which soda ash or like cleansing agent may be added, and after scrubbing, the floor should be mopped with a solution of formaldehyde of 1 or 2 per cent. strength or with a solution of other approved disinfectant; (e) all arms of seats, panels between windows, window ledges, windows, doors and door-knobs shall be washed with soap and water, to which a cleansing agent may be added, and after washing, should be wiped off with an efficient disinfecting solution; (f) closet floors and walls should be cleaned by sweeping and washing and wiping with a disinfecting solution, and urinals and hoppers thoroughly cleaned and disinfected; (g) water coolers shall be frequently emptied, rinsed and scalded, and shall be filled with potable drinking water when in service; (h) and lastly, day coaches shall be disinfected with formaldehyde gas in quantities of not less than 40 fluid ounces of 40 per cent. formaldehyde to each coach at the period of general cleaning and renovation, said period not to exceed 90 days, and also whenever a case of any listed disease is known to have been carried.

Plush seats and backs shall be removed when possible, and dusted by air blast.

Rule 2. Placards shall be displayed in all railway waiting rooms in Indiana, having plainly displayed thereon the following notice:

SPITTING ON THE FLOOR IS FORBIDDEN.

Consumption, lagrippe, coughs, colds and all diseases of the air passages are spread by spitting, and these maladies kill 12,000 people annually in Indiana. It is therefore forbidden to spit on the floor. Penalty, five dollars fine.

It is the duty of depot employes to warn against violating this health rule. By order of the

INDIANA STATE BOARD OF HEALTH.

Rule 3. Parlor, Buffet and Dining Cars shall be cleaned at cleaning terminals, as set forth in Rule 1, carpets and draperies to be removed, dusted and sunned and aired, provided meteorological conditions permit. Food boxes, refrigerators, closets, drawers and cupboards to be cleaned, scalded and treated with a 1 or 2 per cent. solution of formaldehyde at least once each week in spring, summer and autumn months, and once every two weeks in winter months.

Rule 4. Suburban, Electric and Street Cars shall be cleaned as follows: (a) Windows and doors shall be open and the aisle strip, if there be any, removed from the car; (b) all upholstering dusted and brushed; (c) floor mopped or swept after it has been sprinkled with water to which should be added an approved disinfectant; (d) after cleaning as in (c), the floor should be scrubbed with soap and water to which soda ash or like cleansing agent may be added, and after scrubbing, the floor should be mopped with a solution of formaldehyde of 1 or 2 per cent. strength, or with a solution of other approved disinfectant; (e) once each week, the arms of seats, panels between windows, window ledges and windows shall be washed with soap and water to which cleansing agents may be added, and after such washing, should be wiped off with an efficient disinfectant solution; (f) closet floors and walls shall be cleansed by sweeping, washing and wiping with disinfectant solution every week, and floors of closets, urinals, and hoppers shall be thoroughly cleansed and disinfected every day; (g) water coolers shall be frequently emptied, rinsed and scalded, or they may be disinfected with a 2 per cent. solution of formaldehyde, and shall be filled with potable drinking water when in service; (h) electric suburban coaches shall be disinfected with

formaldehyde gas in quantities of not less than 20 fluid ounces of 40 per cent. formaldehyde to each coach at the period of general cleaning and renovation, not to exceed ninety days, and also whenever a case of any listed disease is known to have been carried. Plush seats and backs shall be removed when possible, and dusted by air blast. Carpets and mattings are condemned and forbidden in smoking compartments, but rubber aisle strips or linoleum may be used.

Placards shall be displayed in all waiting rooms and stations located in towns, villages and cities in Indiana, having plainly displayed thereon the following notice:

SPITTING ON THE FLOOR IS FORBIDDEN.

Consumption, lagrippe, coughs, colds and all diseases of the air passages are spread by spitting, and these maladies kill 12,000 people annually in Indiana. It is therefore forbidden to spit on the floor. Penalty, five dollars fine.

It is the duty of depot employes to warn against violating this health rule. By order of the

INDIANA STATE BOARD OF HEALTH.

Rule 5. Conductors and brakemen in charge of steam trains, and conductors and motormen in charge of suburban electric and street cars, shall pay proper attention to ventilation, and shall promptly reprove and warn all persons who spit on the floor or otherwise befoul the car in which they are riding. They shall also inquire concerning any case of sickness which they may notice, and determine as best they can whether or not it is a listed disease, and if found or suspected to be listed, the health officer at the next stop may be appealed to for the purpose of caring for the case as seems best.

Rule 6. Sleeping Cars. Upon arrival at cleaning terminals, sleeping cars shall be cleaned as follows: (a) Windows, doors and ventilators opened; (b) upper berths let down, seat bottoms lifted off, and mattresses, blankets, pillows and curtains, etc., loosely displayed for airing, and, provided the weather will permit, all the articles named shall be aired outside the cars; (c) carpets, rugs and portieres shall be removed from cars, weather permitting, and dusted and aired in the open, otherwise the work shall be done as best can be in the wide opened car; (d) after cleaning, the floor

should be scrubbed with soap and water to which soda ash or like cleansing agent may be added, and after scrubbing, the floor should be mopped with a solution of formaldehyde of 1 or 2 per cent. strength, or with a solution of other approved disinfectant; (e) all windows and woodwork shall be thoroughly cleaned with approved detergents and carefully wiped; (f) closets, spittoons and toilet arrangements shall be thoroughly cleaned and disinfected with an approved disinfectant every day; (g) sleeping cars shall be disinfected at least once a month in an approved manner with formaldehyde gas, as set forth in (h) of Rule 1, and they shall also be disinfected if at any time it is known that a person with a listed infectious disease has been carried. Pullman conductors and porters shall see to it that as good ventilation as is possible is always maintained.

Rule 7. The Listed Diseases are declared to be: Smallpox, diphtheria, scarlet fever, erysipelas and measles. All common carriers and their employes are forbidden to knowingly carry any person afflicted with the above named diseases.

RECOMMENDATIONS.

It is recommended that conductors and brakemen be supplied with pocket paper pads having the following notice printed on each slip:

HEALTH NOTICE.

Spitting on the floor is forbidden. It is filthy, makes a nuisance and is contrary to law. All diseases of the lungs and air passages, also certain other diseases, are spread by dried spit. Over 12,000 people die annually in Indiana from "spit diseases" caught from spitters. Not less than 200,000 cases of sickness are caused thereby in Indiana annually. Spitting on the floors and sidewalks must stop. Ladies do not spit. *Gentlemen will not spit.*

INDIANA STATE BOARD OF HEALTH.

Conductors and brakemen should hand these slips to spitters. They may also be handed to passengers who are not spitters. Persistence in this matter will surely lessen the spitting evil. This will make traveling more pleasant and so encourage travel. Car cleaning will also be made less difficult and less expensive.

DISINFECTION.

The best and cheapest disinfection for cars and rooms may be accomplished in the following way:

Close all openings, and for each 1,000 cubic feet use six and one-half ounces of permanganate potassium and one pint of 40 per cent. solution of formaldehyde. Place the permanganate in a large tin dishpan or any like vessel, then pour the formaldehyde solution upon it. The formaldehyde gas will be quickly set free and will penetrate plush, curtains, carpets and all parts of the car or room, causing complete disinfection. The rapid disengagement of the gas is an important point, and this method further commends itself because no fire or apparatus is required.

After full discussion of the above rules and recommendations it was

Moved by Dr. Tucker and seconded by Dr. Eisenbeiss that Rule 1 be adopted. Carried.

Moved by Dr. Tucker and seconded by Dr. Hurty that Rule 2 be adopted. Carried.

Moved by Dr. Tucker and seconded by Dr. Hurty that Rule 3 be adopted. Carried.

Moved by Dr. Tucker and seconded by Dr. Eisenbeiss that Rule 4 be adopted. Carried.

Moved by Dr. Tucker and seconded by Dr. Eisenbeiss that Rule 5 be adopted. Carried.

Moved by Dr. Eisenbeiss and seconded by Dr. Tucker that Rule 6 be adopted. Carried.

Moved by Dr. Eisenbeiss and seconded by Dr. Hurty that Rule 7 be adopted. Carried.

Moved by Dr. Tucker and seconded by Dr. Eisenbeiss that the recommendations be adopted. Carried.

Moved by Dr. Eisenbeiss and seconded by Dr. Tucker that all of the rules as above written, and also the recommendations, be adopted as a whole. Carried.

Ordered, The Secretary is authorized and directed to purchase three copies of a book entitled, "A Directory of Institutions and Societies Dealing With Tuberculosis in the United States," compiled by the National Association for the study and prevention of tuberculosis.

PAPERS READ AT THE HEALTH OFFICERS' SCHOOL.

After a review and discussion of papers read at the health officers' school it was

Ordered, The Secretary shall select such papers as his judgment shall dictate and have them published in pamphlet form, 1,000 copies to be printed.

SALARY OF DEPUTY STATE INSPECTOR OF FOODS AND DRUGS.

Moved by Dr. Tucker and seconded by Dr. Hurty that the salary of the deputy State inspector of foods and drugs, whose appointment has been heretofore authorized, shall be \$60 per month and expenses, the same to be paid out of the laboratory maintenance fund, and, further, all conflicting resolutions and motions are repealed.

Carried.

FOOD AND DRUG RULES.

Rules of the Indiana State Board of Health, According to Chapter CXXI, Acts of 1899, Establishing Minimum Standards and Defining Specific Adulterations of Foods and Drugs.

(Passed July 7, 1905.)

EXPLANATORY.

The laws relating to the manufacture and sale of food products are so varied and the standards of composition so dissimilar among the different States that for the guidance of manufacturers, jobbers and retailers, the State Board of Health in regular session held at Indianapolis, July 7, 1905, adopted the rules herewith, which define and fix standards for food and drugs.

These rulings furnish a definite basis for work in the enforcement of the "Pure Food Law," and are intended to anticipate any question as to the attitude of the State Board of Health in regard to the application of the law to particular articles of food and will be recognized as such at the State Laboratory of Hygiene.

The definitions and standards adopted are generally those established as official for the United States by the Secretary of Agricul-

ture by authority of an act of Congress approved June 3, 1902; or said standards as given in the latest edition of the United States Pharmacopœia, or after thorough investigation and trial adopted by many of the States.

DEFINITIONS.

1. Offering or exposing for sale or selling adulterated food is prohibited.

2. The term "food," as used herein, shall include confectionery, condiments, and all articles used for food or drink by man, and if there be more than one quality of any article of food known by the same name, the best quality thereof shall be furnished to the purchaser unless he otherwise requests at the time of making such purchase, or unless he be notified at such time of the inferior quality of the article delivered.

3. An article shall be deemed to be adulterated within the meaning of Section 1, of the general food law: (a) In the case of drugs, (1) if when sold under or by a name recognized by the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein, unless the order calls for an article inferior to such standard, or unless such difference is made known or so appears to the purchaser at the time of such sale; (2) if when sold under or by a name not recognized by the United States Pharmacopœia, but which is found in some other pharmacopœia, or other standard work on materia medica, it differs from the standard of strength, quality, or purity laid down in such work; (3) if its strength or purity falls below the professed standard under which it is sold. (b) In the case of food, (1) if any substance or substances have been mixed with it, so as to reduce, or lower, or injuriously affect its quality or strength; (2) if any inferior or cheaper substance or substances have been substituted wholly or in part for it; (3) if any valuable constituent has been wholly or in part abstracted from it; (4) if it is an imitation of or sold under the name of another article; (5) if it consists wholly or in part of a diseased, decomposed, putrid or rotten animal or vegetable substance, whether manufactured or not, or in the case of milk, if it is the product of a diseased animal; (6) if it is colored, coated, polished or powdered whereby damage is con-

cealed, or if it is made to appear better or of a greater value than it really is; (7) if it contains any added poisonous ingredients which may render it injurious to the health of the person consuming it.

The provisions of the pure food law do not apply to mixtures or compounds recognized as ordinary articles of food and drink, provided they are not injurious to health, and are distinctly labeled as mixtures or compounds, with the name and per cent. of each ingredient therein. Names of mixtures and compounds shall not be taken from ingredients which exist in said mixtures and compounds in small quantities.

ANIMAL PRODUCTS.

MEATS AND THE PRINCIPAL MEAT PRODUCTS.

MEATS.

Definitions.—1. Meat is any sound, dressed, and properly prepared edible part of animals in good health at the time of slaughter. The term “animals,” as herein used, includes not only mammals, but fish, fowl, crustaceans, mollusks, and all other animals used as food.

2. Fresh meat is meat from animals recently slaughtered or preserved only by refrigeration.

3. Salted, pickled and smoked meats are unmixed meats preserved by salt, sugar, vinegar, spices or smoke, singly or in combination, whether in bulk or in packages.

Standard.—Standard meat, fresh meat, and salted, pickled and smoked meats are such as conform respectively to the foregoing definitions.

MANUFACTURED MEATS.

Definition.—Manufactured meats are meats not included in definitions 2 and 3, whether simple or mixed, whole or comminuted, in bulk or packages, with or without the addition of salt, vinegar, spices, smokes, oils, or rendered fat.

Standard.—Standard manufactured meats conform to the foregoing definition. If they bear names descriptive of composition,

they correspond thereto and when bearing such descriptive names if force or flavoring meats are used, the kind and quantity thereof are made known.

LARD.

Definitions.—Lard is the rendered fresh fat from slaughtered, healthy hogs.

Leaf lard is the lard rendered at moderately high temperatures from the internal fat of the abdomen of the hog, excluding that adherent to the intestines.

Standard.—Standard lard and standard leaf lard are lard and leaf lard, respectively, free from rancidity, containing not more than one (1) per cent. of substances other than fatty acids not fat, necessarily incorporated therewith in the process of rendering, and standard leaf lard has an iodine number not greater than sixty (60).

Definition.—Neutral lard is lard rendered at low temperature.

MILK AND ITS PRODUCTS.

MILKS.

Definition.—Milk (whole milk) is the lacteal secretion obtained by the complete milking of one or more healthy cows properly fed and kept, excluding that obtained within fifteen days before and five days after calving.

Standard.—(a) Standard milk is milk containing not less than twelve (12) per cent. of total solids and not less than eight and one-half (8.5) of solids not fat, nor less than three and one-quarter (3.25) of milk fat.

(b) Water existing in cow's milk in excess of 88 per cent. shall be an adulteration. Any coloring matter added, for any purpose whatsoever, shall be an adulteration. Any chemical antiseptic, whatever, added for any purpose whatsoever, shall be an adulteration.

(c) Milk sold or offered for human consumption that is taken from a cow fed with damaged food, or any food which will impart a disagreeable flavor is impure, and shall be considered as adulterated.

(d) Milk sold or offered for human consumption that is taken from any sick or diseased cow, or any cow that is given polluted water to drink, or which is kept under conditions contrary to the rules of the State Board of Health governing dairies, is impure, and shall be considered as adulterated.

Definitions.—Blended milk is milk modified in its composition so as to have a definite and stated percentage of one or more of its constituents.

Skim milk is milk from which a part or all of the cream has been removed.

Standard.—Standard skim milk is skim milk containing not less than nine and one-quarter (9.25) per cent. of milk solids.

Definitions.—Buttermilk is the product that remains when butter is removed from milk or cream in the process of churning.

Pasteurized milk is standard milk that has been heated below boiling, but sufficiently to kill most of the active organisms present and immediately cooled to fifty (50) degrees Fahr., or lower, to retard the development of their spores.

Sterilized milk is standard milk that has been heated to the temperature of boiling water or higher for a length of time sufficient to kill all organisms present.

Condensed milk is milk from which a considerable portion of water has been evaporated.

Sweetened condensed milk is milk from which a considerable portion of water has been evaporated and to which sugar (sucrose) has been added.

Standard.—Standard condensed milk and standard sweetened condensed milk are condensed milk and sweetened condensed milk, respectively, containing not less than twenty-eight (28) per cent. of milk solids, of which not less than one-fourth is milk fat.

Definition.—Condensed skim milk is milk from which a considerable portion of water has been evaporated.

MILK FAT OR BUTTER FAT.

Milk fat or butter fat is the fat of milk.

Standard.—Standard milk fat or butter fat has a Reichert-Meissel number not less than twenty-four (24) and a specific gravity not less than 0.905 (40 deg. C.).

CREAM.

Definition.—Cream is that portion of milk, rich in butter fat, which rises to the surface of milk on standing, or is separated from it by centrifugal force.

Standard.—Cream contains not less than eighteen (18) per cent. of milk fat.

Evaporated cream is cream from which a considerable portion of water has been evaporated.

BUTTER.

Definitions.—Butter is the product made by gathering in any manner the fat of fresh or ripened milk or cream into a mass, which also contains a small portion of other milk constituents, with or without salt. Butter may also contain additional coloring matter.

Renovated or process butter is the product made by melting butter and reworking, without the addition or use of chemicals or any substances except milk, cream or salt.

Standards.—Butter must contain not less than eighty-two and five-tenths (82.5) per cent. of butter fat.

Renovated or process butter contains not more than sixteen (16) per cent. of water and at least eighty-two and five-tenths (82.5) per cent. of butter fat.

CHEESE.

Definitions.—Cheese is the solid and ripened product obtained by coagulating the casein of milk by means of rennet acids, with or without the addition of ripening ferments and seasoning. Cheese may also contain additional coloring matter.

Whole milk cheese or full cream cheese is cheese made from milk from which no portion of the fat has been removed.

Skim milk cheese is cheese made from milk from which any portion of the fat has been removed.

Cream cheese is cheese made from milk and cream, or milk containing not less than six (6) per cent. of fat.

Standard.—Standard whole milk cheese or full cream cheese is whole milk or full cream cheese containing in the water free substance not less than fifty (50) per cent. of butter fat.

MISCELLANEOUS MILK PRODUCTS.

Whey is the product remaining after the removal of fat and casein from milk in the process of cheese making.

Kumiss is mare's or cow's milk, with or without the addition of sugar (sucrose) which has undergone alcoholic fermentation.

VEGETABLE PRODUCTS.

GRAIN PRODUCTS.

Definition.--Grain is the fully matured, clean, sound and dried seed of wheat, maize, rice, oats, rye, buckwheat, barley, sorghum, millet or spelt.

Meal is the sound product made by grinding grain.

Flour is the fine sound product made by bolting wheat meal.

Standard.—Flour contains not more than thirteen and one-half (13.5) per cent. of moisture, not less than one and twenty-five hundredths (1.25) per cent. of nitrogen, not more than one (1.0) per cent. of ash and not more than fifty hundredths (0.50) per cent. of fiber.

Definitions.—Graham flour is unbolted wheat meal.

“Whole wheat flour,” “entire wheat flour” improperly so called, is fine wheat meal from which a part of the bran has been removed.

Gluten flour is the flour made from flour by the removal of starch.

Standard.—Standard gluten flour contains not less than five and six-tenths (5.6) per cent. of nitrogen and not more than ten (10.0) per cent. of moisture.

Definition.—Maize meal, corn meal, or Indian corn meal is made from sound maize grain.

Standard.—Standard maize meal, corn meal, or Indian meal contains not more than fourteen (14.0) per cent. of moisture, not less than one and twelve hundredths (1.12) per cent. of nitrogen and not more than one and six-tenths (1.6) per cent. of ash.

Definitions.—Rice is the hulled and polished grain of *Oryza Sativa*.

Oat-meal is meal made from hulled oats.

Standard.—Standard oat-meal contains not more than eight (8.0) per cent. of moisture, not more than one and five-tenths (1.5) per cent. of crude fiber, not less than two and twenty-four hundredths (2.24) per cent. of nitrogen, and not more than two and two-tenths (2.2) per cent. of ash.

Definition.—Rye flour is the fine sound product made by bolting rye meal.

Standard.—Standard rye flour contains not more than thirteen and one-half (13.5) per cent. of moisture, not less than one and thirty-six hundredths (1.36) per cent. of nitrogen, and not more than one and twenty-five hundredths (1.25) per cent. of ash.

Definition.—Buckwheat flour is bolted buckwheat meal.

Standard.—Standard buckwheat flour contains not more than twelve (12.0) per cent. of moisture, not less than one and twenty-eight hundredths (1.28) per cent. of nitrogen and not more than one and seventy-five hundredths (1.75) per cent. of ash.

FRUIT AND FRUIT PRODUCTS.

Definition.—Fruit jellies, fruit butters, preserves, canned fruits, fruit conserves, confections, fruit juices and syrups are preparations of the various fruits preserved only with cane sugar and free from artificial flavors, coloring matter and preservatives.

If such articles contain a substitute for the fruit or any injurious material to make up bulk or weight, any artificial flavor, color or antiseptics or any substance not naturally occurring in such fruit—except spices or other wholesome, natural flavoring material, they shall be considered to be adulterated.

FLAVORING EXTRACTS.

Definition.—Flavoring extracts are ethyl alcohol solutions of the sapid and odorous principles with or without the coloring matters of aromatic plants, or parts of plants, used for flavoring food; and are derived from the plants whose names they bear.

Definitions and Standards.—Lemon extract is the solution made by macerating lemon peel with a solution of oil of lemon in deodorized ethyl alcohol and subsequently filtering; and contains not less than five (5) per cent. by weight of oil of lemon and not less than

eighty-five (85) per cent. by weight of ethyl alcohol, and no coloring material except that derived from the lemon peel in the process of manufacture.

Vanilla extract is the solution made by macerating and subsequently percolating vanilla beans previously triturated with sugar (sucrose), with ethyl alcohol and contains not less than five-hundredths (0.05) per cent. of vanilla derived from the vanilla bean, together with the gums, resins and other extractive matters characteristic of the vanilla bean and extracted therefrom in the process of manufacture, and not less than thirty-five (35) per cent. by weight of ethyl alcohol. No added coloring material must be present.

OLIVE OIL.

Definition.—Olive oil is the oil extracted by pressure from the sound mature fruit of the cultivated olive tree, "*Olea Europea* L." and subjected to the usual refining process.

Standard.—Standard olive oil is free from rancidity and contains in one hundred (100) cubic centimeters not more than five (5) grains of free fatty acid, and has an iodine number not exceeding eighty-eight (88).

SUGARS AND RELATED SUBSTANCES.

Definitions.—Sugar is the product chemically known as sucrose (saccharose) chiefly obtained from sugar cane, sugar beets, sorghum, maple or palm.

Granulated, loaf, cut, milled and powdered sugars are different forms of standard sugars.

Standard.—Standard sugar is white sugar containing at least ninety-nine and five-tenths (99.5) per cent. of sucrose.

Definitions.—Maple sugar is the solid product resulting from the evaporation of maple sap.

Masseuite, melada, mush sugar and concrete are products obtained by evaporating the purified juice of a sugar-producing plant, or a solution of sugar, to a solid or semisolid consistence in crystalline state.

Molasses is the product left after separating the sugar from masseuite, melada, mush sugar or concrete.

Standard.—Standard molasses is molasses containing not more than twenty-five (25) per cent. of water nor more than five (5) per cent. of ash.

Refiner's sirup ("treacle") is the residual liquid product obtained in the process of refining raw sugars.

Standard.—Standard refiner's sirup is sirup containing not more than twenty-five (25) per cent. of water nor more than eight (8) per cent. of ash.

Definitions.—Sirup is the product obtained by purifying and evaporating the juice of a sugar-producing plant without removing any of the sugar.

Sugar-cane sirup is sirup obtained by the evaporating of the juice of the sugar-cane or by the solution of sugar-cane concrete.

Sorghum sirup is a sirup obtained by the evaporation of sorghum juice or by the solution of sorghum concrete.

Maple sirup is a sirup obtained by the evaporation of maple sap or by the solution of maple concrete.

Sugar sirup is a product obtained by dissolving sugar to the consistence of a sirup.

Standard.—Standard sirup is a sirup containing not more than thirty (30) per cent. of water nor more than two and five-tenths (2.5) per cent. of ash.

GLUCOSE PRODUCTS.

Definition.—Starch sugar is the solid product obtained by hydrolyzing starch or a starch-containing substance until the greater part of the starch is converted into dextrose. Starch sugar appears in commerce in two forms, anhydrous and hydrous. In the former the sugar is crystallized without water of crystallization; in the latter it is crystallized with water of crystallization. The hydrous varieties are commonly known as 70 and 80 sugars; 70 sugar is also known as brewer's sugar, and 80 sugar as climax or acme sugar.

Standards.—Standard 70 sugar or brewer's sugar is hydrous starch sugar containing not less than seventy (70) per cent. of dextrose and not more than eight-tenths (0.8) per cent. of ash.

Standard 80 sugar, climax or acme sugar is hydrous starch sugar containing not less than eighty (80) per cent. of dextrose and not more than one and one-half (1.5) per cent. of ash.

Standard anhydrous starch sugar contains not less than ninety-five (95) per cent. of dextrose without water of crystallization and not more than eight-tenths (0.8) per cent. of ash.

The ash of these standard products consists almost entirely of chlorides and sulphates of lime and soda.

Definition.—Glucose, mixing glucose, or confectioner's glucose is a thick, sirupy, colorless substance obtained by incompletely hydrolizing starch or a starch-containing substance, decolorizing and evaporating the product. It is found in various degrees of concentration, ranging from forty-one (41) to forty-five (45) degrees Baume, at one hundred (100) degrees Fahr. and thirty-seven and seven-tenths (37.7) degrees C.

Standard.—Standard glucose, mixing glucose, or confectioner's glucose is colorless glucose, varying in density between forty-one (41) and forty-five (45) degrees Baume, at a temperature of one hundred (100) degrees F. (37.7 deg. C.). It conforms in density within these limits, to the degree Baume it is claimed to show and for a density of forty-one (41) degrees Baume contains not more than twenty-one (21) per cent. of water and for a density of forty-five (45) degrees not more than fourteen (14) per cent. It contains on a basis of forty-one (41) degrees Baume not more than one (1) per cent. of ash, consisting chiefly of chlorides and sulphates of lime, and soda.

Definitions.—Glucose sirup or corn sirup is glucose unmixed or mixed with sirup, molasses or refiner's sirup.

Standard.—Standard glucose sirup or corn sirup is glucose sirup or corn sirup containing not more than twenty-five (25) per cent. of water and not more than three (3) per cent. of ash.

CANDY.

Candy is a product prepared from a saccharine substance or substances, with or without the addition of harmless coloring, flavoring or filling materials.

Standard.—Standard candy is candy containing no terra alba, barytes, talc, chrome yellow, or other mineral substances or poisonous colors or flavors or other ingredients injurious to health.

HONEY.

Definitions.—Honey is the nectar and saccharine exudations of plants gathered, modified and stored in the comb by honey bees. (*Apis Mellifica*.)

Comb honey is honey contained in the cells of comb.

Extracted honey is honey which has been separated from the uncrushed comb by centrifugal force or gravity.

Strained honey is honey removed from the crushed comb by straining or other means.

Standard.—Standard honey is laevo-rotatory, contains not more than twenty-five (25) per cent. of water, not more twenty-five hundredths (0.25) per cent. of ash and not more than eight (8) per cent. of sucrose.

SPICES.

General Definitions.—Spices are aromatic vegetable substances used for the seasoning of food.

General Standard.—Standard spices are sound spices, true to name, from which no portion of any volatile or other flavoring principle has been removed.

Definition.—Allspice or pimento is the dried fruit of *Pimento officinalis* L. Karst.

Standard.—Standard allspice is allspice containing not less than eight (8) per cent. of quercitannic acid; not more than six (6) per cent. of total ash; not more than five-tenths (0.5) per cent. of ash insoluble in hydrochloric acid, and not more than twenty-five (25) per cent. of crude fiber.

Definitions.—Anise is the fruit of *Pimpinella Anisum* L.

Bay leaf is the dried leaf of *Laurus nobilis* L.

Capers are the flower buds of *Capparis spinosa* L.

Caraway is the fruit of *Carum carvi* L.

CAYENNE AND RED PEPPERS.

Red pepper is the red, dried, ripe fruit of any species of *capsicum*.

Cayenne pepper, or cayenne, is the dried fruit of *capsicum frutescens* L., *Capsicum baccatum* L., or some other small fruited species of *capsicum*.

Standard.—Standard cayenne pepper is cayenne pepper containing not less than fifteen (15) per cent. of non-volatile ether extract, not more than six and five-tenths (6.5) per cent. of total ash, not more than five-tenths (0.5) per cent. of ash insoluble in hydrochloric acid; not more than one and five-tenths (1.5) per cent. of starch and not more than twenty-eight (28) per cent. of crude fiber.

Definitions.—Celery seed is the dried seed of *Apium graveolens* L.

Cinnamon is the dried bark of any species of the genus *cinnamomum*, from which the outer layers may or may not have been removed.

True cinnamon is the dried inner bark of *Cinnamomum zeylanicum* Breyne.

Cassia is the dried bark of various species of *cinnamomum*, other than *cinnamomum zeylanicum*, from which the outer layers may or may not have been removed.

Cassia buds are the dried immature fruit of species of *cinnamomum*.

Ground cinnamon, or ground cassia, is a powder consisting of cinnamon, cassia, or cassia buds, or a mixture of these species.

Standard.—Standard cinnamon or cassia is cinnamon or cassia containing not more than eight (8) per cent. of total ash and not more than two (2) per cent. of sand.

Definition.—Cloves are the dried flower buds of *caryophyllus aromaticus* L.

Standard.—Standard cloves are cloves containing not more than five (5) per cent. of clove stems; not less than ten (10) per cent. of volatile ether extract; not less than twelve (12) per cent. of quercitannic acid; not more than eight (8) per cent. of total ash; not more than five-tenths (0.5) per cent. of ash insoluble in hydrochloric acid, and not more than ten (10) per cent. of crude fiber.

Definitions.—Coriander is the dried fruit of *coriandrum sativum* L.

Cumin seed is the fruit of *cuminum cymimun* L.

Dill seed is the fruit of *Anethum graveolens* L.

Fennel is the fruit of *Foeniculum foeniculum* L. Karst.

Ginger is the washed and dried, or decorticated and dried rhizome of *zingiber zinziber* L. Karst.

Standard.—Standard ginger is ground or whole ginger containing not less than forty-two (42) per cent. of starch; not more than eight (8) per cent. of crude fiber; not more than eight (8) per cent. of total ash; not more than one (1) per cent. of lime, and not more than three (3) per cent. of ash insoluble in hydrochloric acid.

Definition.—Limed or bleached ginger is whole ginger coated with carbonate of lime.

Standard.—Standard limed or bleached ginger is limed or bleached ginger containing not more than ten (10) per cent. of ash, not more than four (4) per cent. of carbonate of lime, and conforming in other respects to standard ginger.

Definition.—Horseradish is the root of *Roripa armoracia* L. Hitchcock.

Standard.—Standard grated or ground horseradish may be mixed with vinegar.

Definition.—Mace is the dried arillus of *myristica fragrans* Houttuyn.

Standard.—Standard mace is mace containing not less than twenty (20) nor more than thirty (30) per cent. of nonvolatile ether extract; not more than three (3) per cent. of total ash; not more than five-tenths (0.5) per cent. of ash insoluble in hydrochloric acid, and not more than ten (10) per cent. of crude fiber.

Definitions.—Macassar or Papua mace is the dried arillus of *myristica argentea* Warb.

Bombay mace is the dried arillus of *myristica malabarica* Lamarck.

Marjoram is the leaf, flower and branch of *Marjorana marjorana* L. Karst.

Mustard seed is the seed of *Sinapis Alba* L. (white mustard), *Brassica nigra* L. Koch (black mustard), or *Brassica juncea* L. Coss (black or brown mustard).

Ground mustard is a powder made from mustard seed with or without the removal of the hulls and a portion of the fixed oil.

Standard.—Standard ground mustard is mustard containing not more than two and five-tenths (2.5) per cent. of starch and not more than eight (8) per cent. of total ash.

Definition.—Nutmeg is the dried seed of *myristica fragrans* Houttuyn, deprived of its testa and with or without a thin coating of lime.

Standard nutmegs, ground or unground, are nutmegs containing not less than twenty-five (25) per cent. of nonvolatile ether extract; not more than five (5) per cent. of total ash; not more than five-tenths (0.5) of ash insoluble in hydrochloric acid, and not more than ten (10) per cent. of crude fiber.

Definition.—Macassar, Papua, male or long nutmeg is the dried seed of *Myristica Argentea* Warb deprived of its testa.

Paprica is the dried ripe fruit of *capsicum annum* L. or some other large fruited species of *Capsicum*.

PEPPER.

Black pepper is the dried immature berries of *Piper nigrum* L.

Standard.—Standard black pepper is black pepper free from added pepper shells, pepper dust, and other pepper by-products and containing not less than six (6) per cent. of nonvolatile ether extract; not less than twenty-five (25) per cent. of starch; not more than seven (7) per cent. of total ash; not more than two (2) per cent. of ash insoluble in hydrochloric acid, and not more than fifteen (15) per cent. of crude fiber. One hundred parts of the nonvolatile ether extract contain not less than three and one-quarter (3.25) parts of nitrogen.

Definitions.—Long pepper is the dried fruit of *Piper longum* L.

White pepper is the dried mature berries of *Piper nigrum* L., from which the outer coating, or the outer and inner coatings, have been removed.

Standard.—Standard white pepper is white pepper containing not less than six (6) per cent. of nonvolatile ether extract; not less than fifty (50) per cent. of starch; not more than four (4) per cent. of total ash; not more than five-tenths (0.5) per cent. of ash insoluble in hydrochloric acid, and not more than five (5) per cent. of crude fiber.

One hundred parts of the nonvolatile ether extract contain not less than four (4) parts of nitrogen.

Definitions.—Saffron is the dried stigma of *Crocus Sativus* L.

Sage is the leaves of *Salvia officinalis* L.

Savory, or summer savory, is the leaf, blossoms and branch of *Satureia hortensis* L.

Thyme is the leaf and tip of blooming branches of *Thymus vulgaris* L.

COCOA AND COCOA PRODUCTS.

Definitions.—Cocoa beans are the seeds of the cacao tree. *Theobroma cacao L.*

Cocoa nibs, or cracked cocoa, is the roasted, broken cocoa bean freed from its shell or husk.

Chocolate, plain or bitter, or chocolate liquor, is the solid or plastic mass obtained by grinding cocoa nibs without the removal of fat or other constituents except the germ.

Standard.—Standard chocolate is chocolate containing not more than three (3) per cent. of ash insoluble in water, three and fifty-hundredths (3.50) per cent. of crude fiber, and nine (9) per cent. of starch, nor less than forty-five (45) per cent. of cocoa fat.

Definition.—Sweet chocolate and chocolate coatings are plain chocolate mixed with sugar (sucrose) with or without the addition of cocoa butter, spices, or other flavoring materials.

Standard.—Standard sweet chocolate and standard chocolate coatings are sweet chocolate and chocolate coatings containing in the sugar-free and fat-free residue no higher percentage of either ash, fiber or starch than is found in the sugar-free and fat-free residue of plain chocolate.

Definition.—Cocoa or powdered cocoa is cocoa nibs, with or without the germ, deprived of a portion of its fat and finely pulverized.

Standard.—Standard cocoa is cocoa containing percentages of ash, crude fiber and starch corresponding to those in chocolate after correction for fat removed.

Definition.—Sweet or sweetened cocoa is cocoa mixed with sugar (sucrose).

Standard.—Standard sweet cocoa is sweet cocoa containing not more than sixty (60) per cent. of sugar (sucrose) and in the sugar-free and fat-free residue no higher percentage of either ash, crude fiber or starch than is found in the sugar-free and fat-free residue of plain chocolate.

COFFEE.

Standard coffee is the seed of the *Coffea Arabica*, roasted and prepared for use. It must not be coated or polished or treated in any way by which inferiority is concealed.

Mixture of cereals or other articles sold as substitutes for coffee must be sold as a mixture or compound under an original or coined name, and not under the name of any ingredient thereof.

TEA.

Standard tea consists of the prepared leaves or leaf buds of the true tea-plant, free from artificial coloring matter and filler.

FRUIT JUICES.

Unfermented.—Apple cider, grape juice, lime juice, lemon juice, orange juice, and all other fruit juices are the unfermented juices of the fruits under whose name they are sold, with or without the addition of sugar (sucrose). Standard fruit juices must be free from added coloring matter and preservatives.

Fermented Fruit Juices. Definitions and Standards.—Wine is the product made by the normal alcoholic fermentation of the juice of sound, ripe grapes, and the usual cellar treatment, and contains not less than seven (7) nor more than sixteen (16) per cent. of alcohol, by volume, and, in one hundred (100) cubic centimeters, not more than one-tenth (0.1) gram of sodium chloride nor more than two-tenths (0.2) gram of potassium sulphate; and for red wine not more than fourteen hundredths (0.14) gram, and for white wine, not more than twelve hundredths (0.12) gram of volatile acids derived from fermentation and calculated as acetic acid.

Red wine is wine containing the red coloring matter of the skins of grapes.

White wine is wine made from white grapes or the expressed fresh juice of other grapes.

Dry wine is wine in which the fermentation of the sugars is practically complete, and which contains, in one hundred (100) cubic centimeters, less than one (1) gram of sugars, and for dry red wine not less than sixteen-hundredths (0.16) gram of grape ash and not less than one and six-tenths (1.6) grams of grape solids, and for dry white wine, not less than thirteen-hundredths (0.13) gram of grape ash and not less than one and four-tenths (1.4) grams of grape solids.

Fortified dry wine is dry wine to which brandy has been added, but which conforms in all other particulars to the standard of dry wine.

Sweet wine is wine in which alcoholic fermentation has been arrested, and which contains, in one hundred (100) cubic centimeters, not less than one gram of sugars, and for sweet red wine not less than sixteen-hundredths (0.16) gram of grape ash, and for sweet white wine not less than thirteen-hundredths (0.13) gram of grape ash.

Fortified sweet wine is sweet wine to which wine spirits have been added. "Sweet wine" used for making fortified sweet wine, and "Wine spirits" used for such fortification, are defined as follows: Wine spirits is the product resulting from the distillation of fermented grape juice and shall be held to include the product commonly known as grape brandy; and the pure sweet wine is fermented grape juice only, and shall contain no other substance of any kind whatever, introduced before, at the time of, or after fermentation, and such sweet wine shall contain not less than four (4) per cent. of saccharine matter.

Sparkling wine is wine in which the after part of the fermentation is completed in the bottle, the sediment being disgorged and its place supplied by wine or sugar liquor, and which contains, in one hundred (100) cubic centimeters, not less than twelve hundredths (0.12) gram of grape ash.

Sugar wine is the product made by the addition of sugar to the juice of sound, ripe grapes and subsequent alcoholic fermentation with the usual cellar treatment.

Raisin wine is the product made by alcoholic fermentation of an infusion of dried or evaporated grapes, or of a mixture of such infusion of raisins with grape juice.

VINEGAR.

Definitions and Standards.—Vinegar, cider vinegar, or apple vinegar is the product made by the alcoholic and subsequent acetic fermentations of the juice of apples, is laevorotatory, and contains not less than four (4) grams of acetic acid, not less than two (2) grams of apple solids, and not less than twenty-five hundredths (0.25) grams of apple ash in one hundred (100) cubic centimeters. The water soluble ash from one hundred (100) cubic centimeters of the vinegar requires not less than thirty cubic centimeters of decinormal acid to neutralize the alkalinity, and contains not less than ten (10) milligrams of phosphoric acid (P_2O_5).

Wine vinegar or grape vinegar is the product made by the alcoholic and subsequent acetous fermentations of the juice of the grapes, and contains, in one hundred (100) cubic centimeters, not less than four (4) grams of acetic acid, not less than one and four-tenths (1.4) grams of grape solids, and not less than thirteen-hundredths (0.13) gram of grape ash.

Malt vinegar is the product made by the alcoholic and subsequent acetous fermentations, without distillation, of an infusion of barley, malt or cereals, whose starch has been converted by malt, and is dextro-rotatory, and contains, in one hundred (100) centimeters, not less than four (4) grams of acetic acid, not less than two (2) grams of solids, and not less than two-tenths (0.2) gram of ash. The water-soluble ash from one hundred (100) cubic centimeters of decinormal acid to neutralize its alkalinity, and contains not less than nine (9) milligrams of phosphoric acid (P_2O_5).

Sugar vinegar is the product made by the alcoholic and subsequent acetous fermentations of solutions of a sugar, sirup, molasses, or refiner's sirup, and contains, in one hundred (100) cubic centimeters, not less than four (4) grams of acetic acid.

Glucose vinegar is the product made by the alcoholic and subsequent acetous fermentations of solutions of starch sugar, glucose, or glucose sirup, is dextro-rotatory, and contains, in one hundred (100) cubic centimeters, not less than four (4) grams of acetic acid.

Spirit vinegar, distilled vinegar, grain vinegar is the product made by the acetous fermentation of dilute distilled alcohol, and contains, in one hundred (100) cubic centimeters, not less than four (4) grams of acetic acid.

MISCELLANEOUS FOOD PRODUCTS.

BAKING POWDER.

Definition.—Baking powder is a leavening agent used in the preparation of baker's products. Its value depends upon the amount of carbon dioxid liberated in the process of baking.

Standards.—Standard baking power contains ten (10) per cent. of available carbon dioxid, and no material except such a quantity of starch or other absorbent as may be necessary in the preparation.

CATSUPS.

Definition.—Catsups are preparations of tomato pulp, spices, vinegar and sugar.

Standards.—Standard catsups contain no added coloring material or filler.

ANTISEPTICS.

Definition.—Salicylic acid, benzoic acid, boric acid, hydrofluoric acid, sulphurous acid, and compounds of these acids; formaldehyde or formalin and various mixtures known to the trade as "Freezine," "Iceine," "Formol," "Preservalines" of various kinds, saccharine, betanaphthol, or any other preservatives or their compounds injurious to health, are antiseptics, and food or food products containing them are adulterated. The use of salt, sugar, vinegar, spices, saltpetre and wood smoke, as employed in curing meat, is not prohibited.

FOURTH QUARTER.

Special and Regular Meeting.

SPECIAL MEETING.

September 6, 1905.

Present: Drs. Davis, Tucker, Eisenbeiss, Wishard and Hurty.
The following report was made:

REPORT OF AN EPIDEMIC OF TYPHOID FEVER AT THE INDIANA SOLDIERS' HOME AND REPORTS OF SANITARY SURVEY OF THE INSTITUTION.

Pursuant to the request of the authorities of the Indiana Soldiers' Home, the State health officer visited the institution Friday, August 11th, to inquire into the origin of four cases of typhoid fever; the first one having died, the second and third having recovered, and the fourth, that of hospital surgeon, Dr. Carl McGaughey, just entering the third week of its course.

Sick Records.—The first step in the investigation was to examine the sick records, which were found to be partial and written on cards which were kept in a closet and not filed and indexed. After considerable search and inquiry, it was discovered that about two years ago the first case of clinical typhoid, so far as known, occurred at the home in the person of a young son of Commandant Stormont. The next clinical case recorded was of a young man, Roy Cramer, an engineer, first diagnosed "fever" June 6th, 1905. One June 11th, he was taken home and subsequently died. The second and third cases were a boy, James Neagley, 9 years old, and a girl, Marie Vanover, age 11. The Neagley case was not diagnosed typhoid until convalescent. The Vanover case was quite severe and diagnosed typhoid on June 14th, the ninth day after the physician's first call. The case of Dr. McGaughey was diagnosed typhoid about August 4th. A study of the record cards discovered many cases of sickness which were diagnosed variously as "fever,"

"debility," "chills," and "diarrhœa," the fever in instances continuing ten or twelve days, but in none of these typhoid instances was the correct diagnosis made. Following is the record of the cases:

NAME.	Number and Date of Physician's Visits.	Diagnosis.	Widal Reaction.
*Mrs. Thompson.....+	May 20, 22	Chills	Positive.
*Elis F. Cook.....+	May 24, 28, June 16, 18, 22, 23, 30.	Chills	Positive.
Wallworth.....	May 29	Chills	
*Sarah Ramsey.....+	June 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 20.	Debility.....	Positive.
*Marie Vanover.....+	June 5, 6, 7, 8, 9, 10, 11, 12, 14, 16	Fever	Positive.
*Jas. Neagley.....+	June 6, 7, 8, 9, 10, 11, 12	Fever	Positive.
Boy Cramer.....+	June 8, 7, 8, 9, 10, 11	Fever	Dead.
*Perry Bowers.....+	June 7, 8, 9	Fever	Positive.
*Caroline Armstrong.....+	June 12	Debility.....	Positive.
*Anice Day.....+	June 17, 18, 19, 20, 21, 23, 29, July 6, 7, 8, 9, 10	Debility.....	Positive.
*Beulah Boyd.....+	June 17, 18, 20, 21, 22, 23, July 10, 15.	Debility, Diarrhœa ..	Positive.
Sophia Pearson.....	June 17, 22	Debility.....	
*Enos Allman.....+	June 17	Debility.....	Positive.
C. L. Rose.....	June 17	Diarrhœa	
*Elizabeth Lynn.....+	June 20, 21, 22	Diarrhœa	Positive.
Thelma Gillespie.....	June 22, 23, 24, 27, 28, 29, 30, July 1, 2, 3, 4	Fever	
Abijah Rush.....	June 30	Diarrhœa	
*Mrs. Craig.....	July 9	Diarrhœa	Negative.
*Ellis Brown.....	July 9	Intestinal Putrefaction ..	Negative.
*Sarah Holtzman.....+	July 17	Fever	Positive.
*Jabes Walker.....+	July 18	Debility.....	Positive.
*Mrs. Jabes Walker.....+	July 18	Debility.....	Positive.
*G. G. Smith.....+	July 26, 29, 30, 31	Debility.....	Positive.

Microscopical Studies.—On Monday, August 14th, a second visit to the Home was made by the State health officer, accompanied by Dr. Helen Knabe, assistant bacteriologist of the State Board of Health. Microscope, stains, reagents and apparatus were taken to the Home and a study of the cases began. In the above list the blood of those marked with a * (star) were examined by the Widal test, and those not marked were not examined, because they had left the Home. Of the 17 examined by the Widal test, 14 reacted, proving that they had had typhoid fever, and in the list the positive cases are marked +. Widal tests were also made of cases not on the above list, the persons examined being selected upon inquiry concerning their health since May. The appended summary is of all cases examined.

"B."

SUMMARY OF TYPHOID FEVER CASES AT INDIANA SOLDIERS' HOME.

Investigation commenced August 14, and ended August 22.

Cases investigated	62
Widal reaction positive	50
Diagnosed by clinical symptoms only	2

Convalescent August 22d.....	12
Cases still sick	26
Developed during the last 10 days.....	18
(Most of these cases are in the third week of disease.)	
Entirely recovered	24
Deaths	1

The clinical diagnoses of these cases were—

Fever	6
Chills	2
Diarrhoea	2
Debility	11
No diagnosis made at time of sickness.....	1

The cases were scattered practically over the whole grounds: Laundry, 4 (1 boss and 3 women). Engineers, 3 (one death). Hospital attendants, 2 (one in the kitchen). General dining room, 2. Plumber, 1. Commissary (bookkeeper), 1. General' office building, 1. Matron, 1. Old people's home, 7. Widows' home, 2.

The other cases have occurred in the different cottages and county houses.

Age of patients, 3-97 years. Most of them over 60 years.

THE WATER SUPPLY.

The institution is supplied with deep well water from drilled wells. These are six in number, six inches in diameter with a minimum depth of 65 feet. These wells are situated on the banks of the Wabash River and as their water is hard, contains iron, and rises from five to eight feet above the river level, it is obvious it is not river water nor even contaminated with it. Analysis of the supply shows it to be pure and potable. By steam pumps the water is lifted to the top of the hill and into a large steel tank supported on steel posts. From thence it is distributed by a system of pipes to the various buildings of the institution and to lawn and fire plugs. The tank is well covered and so situated that pollution of its contents is almost impossible. A consideration of all of the facts leads to the conclusion that up to this time the water could not possibly be the carrier of the typhoid infection.

Excavations.—As the grounds had been dug up extensively for several weeks for the building of new sewers and the laying of the water pipes, it was asked if this could not have something to do with causing the epidemic. We are able to answer this positively in the negative, for typhoid germs do not persist in the earth very long, there is no reason to believe that the earth along the lines of

the excavations had ever been polluted, and besides the first cases of typhoid appeared before the digging of the trenches began. Lastly, there are nearer and more rational ways of accounting for the disease.

Sanitary Survey of Buildings and Grounds.—It can be emphatically said of the grounds that they are ideal. They are high, have excellent drainage, have never been pierced with vaults and sink holes and the soil is mostly clay. The buildings are of stone and brick, and many of wood. The county buildings are mostly built on a narrow street and too near together to be sanitary. Dampness exists in the narrow spaces between several of them, and it was noticed in five instances that bedrooms were too small and not properly supplied with air and light. All closets and lavatories inspected are open to more or less sanitary criticisms.

The Hospital.—The building known as the hospital is unworthy of the name. It is astonishing that such a structure could have been built in connection with one of Indiana's public institutions within the last twenty years. The building is constructed of stone and brick, lath and plaster partitions and hardwood floors throughout. The woodwork is poorly done, and nowhere is tiling used for floor or wainscot. There is an uncemented cellar beneath the main building, and the wings are without cellars or basements, but are raised about four feet above the ground on stone foundations. These foundation walls contain too few ventilating windows and at the time of inspection, August 14th, only three were open. Stale ground air, with its earthy and musty smell, was in full evidence. The ceilings are eleven feet, instead of 12 or 15 feet, as they should be in a hospital, and the windows are narrow and too short. Low ceilings and small windows do not admit sufficient light and air, and such conditions are especially bad in hospitals. Screens are not supplied and flies are abundant, and ever ready to carry infection and filth. Flies could very readily have carried the typhoid infection from one bedroom to another, or to the food on the tables, causing the present typhoid epidemic. A urinous or animal-like smell is apparent in many rooms, even after thorough airing, proving that the woodwork has absorbed secretions from the sick occupants. Most of the transoms have no fixtures to turn them, and, being fixed in position, the additional ventilation they could give is denied. The rotunda, built in the cen-

ter of the building, principally for the purpose of supplying light and air, needs repairs, for of the six ventilators only two have ropes and pulleys for opening them, and one of the ropes of these two is broken. There are not enough water-closets and bathrooms, and those which exist are too small, poorly lighted and poorly ventilated. They were all malodorous, for the beaded wooden partitions to the narrow stalls and the wooden floors are saturated with urine. In one closet several auger holes had been bored in the floor, and the scrub water, as well as the urine drip, fell upon the earth beneath, and had made a sodden, stinking place. The closet odors are so strong that they are smelled in the halls and in many rooms. The nurses' office and drug room are particularly redolent with closet smells. The isolation wards and rooms, separated from the hospital proper by a narrow hall, with many doors, is now, and would be under strict discipline, an isolation ward only in name. This is because its separation from the main building is not sufficient and because there are so many doors leading thereto. The plastering in two or three rooms has fallen off in places, and one room is in very bad condition because of a leaky closet above.

As before said, the construction of this hospital is very faulty, and it certainly has not been well kept, and at the time of inspection was very unclean. However, no amount of cleaning could keep such deficiently constructed closets and bathrooms in sanitary conditions. The tables in the hospital dining rooms, as well as those in the general dining rooms and at the old people's home, are not properly cared for. Immediately after meals the tables are set again for the next meal, and crackers, sugar and other foods are left, and, of course, are visited by flies.

Most of the mattresses examined were found to be soiled, and should be destroyed.

Dirty linen from typhoid patients and all others has been thrown together into the cellar and laundered. The typhoid linen should have been soaked in disinfectant in the rooms of the patients, for its general handling is likely to distribute infection. Four of the laundry force have had the disease. The mops and buckets have been kept in closets under the stairways, being put away without washing, disinfecting or drying. It is possible to spread typhoid infection from one room to another by means of soiled and infected mops. The washing of the woodwork in the hospital is rarely

done, as three employes, one a resident of over fifteen months, the other two of over eight months, have testified they had never seen it done. In sick rooms, the doors, door knobs, door casings and all woodwork and walls where hands may be placed are liable to become soiled. Careless nurses, too, who have neglected to carefully wash and disinfect soiled hands, may easily transmit typhoid infection. It is to be remembered that the infection of dysentery and all diarrhoeal diseases may be transmitted by the same methods that spread typhoid infection.

Ice Boxes.—The hospital ice box is made wholly of wood, without metal lining. It is kept as clean as is possible for a box of the kind. It must be infected, for the cook said the milk sometimes spoils quickly, and again sometimes became pink. There was a distinct foreign odor in the box. The ice box at the old people's home is in bad condition.

Garbage.—The garbage receptacle at the general dining room is a wooden box on wheels. It is dirty beyond description. The lid is rarely on and the ground around is reeking with sour spilt garbage. The care of the garbage at the other kitchen is somewhat better, but still unsanitary. The garbage is disposed of by feeding to hogs, which is unobjectionable if properly done. At the home, however, the hog pens are too near the buildings, and are very unsanitary. The odor arising from them is perceptible several hundred feet away.

Dairy.—There is little to criticise at the dairy. The cemented floors, with manure gutters, the stalls, water supply, feed, care in milking, straining and distribution of the milk, are all quite satisfactory. It seems impossible that typhoid infection was distributed from the dairy. No cases of the disease have occurred among the dairy employes.

SUMMARY.

Typhoid fever in mild form and unrecognized has been epidemic at the Indiana Soldiers' Home since early in June, 1905, and probably mild cases have existed from time to time during the last two years. The cases have been pretty generally distributed over the institution. The infection was probably introduced by young Stormont, although it might have been brought in before or since by

unrecognized mild cases. In whatever way the infection found entrance, it certainly has been spread by uncleanness, and not by polluted water or milk.

POSSIBLE METHODS OF TRANSMISSION OF THE INFECTION AT THE HOME.

1. Flies might have carried it from the commode of the sick person, as there are few screens to keep flies away.
2. It might have been distributed in dirty linen, and almost certainly was in four instances.
3. Nurses might have transmitted it upon soiled hands and garments. As the nurses in most instances did not know when they were handling typhoid, they very likely took no extra precautions.
4. Visitors from one room to another might have acquired the disease in infected rooms or carried it to others. Dr. McGaughey doubtless took the infection from handling patients.

RECOMMENDATIONS.

It is recommended that every building be cleaned, disinfected and renovated; that paint and whitewash be freely used; that screens be supplied to all windows and doors; that all water closets, urinals and bathrooms be overhauled and made sanitary; that the garbage be cared for in a sanitary way; that linen connected with transmissible diseases be disinfected before sending to the laundry; that strict rules be passed commanding physicians and nurses to wear washable clothing and to carefully clean and disinfect their hands every time a case of infectious disease is handled; that rules be made governing the general sanitary conditions of the home, and directing the sanitary conduct of the inmates. We append to this report copy of rules which we recommend.

HOSPITAL.

For the hospital there is no full cure except a new building. As this is impossible for at least three years, we recommend the following procedure:

Establish a camp of floored tents and move all patients out of the hospital into them. Bedsteads, chairs and tables should be

cleaned thoroughly with soap and water and disinfectant; bedsteads, commodes and other iron furniture painted with white enamel paint. When the building is empty, thorough formaldehyde disinfection should be given to every room, to basements, and every nook and corner. The disinfection should be followed with thorough cleaning with water, soap and alkali. All the woodwork should be varnished or painted, the floors oiled, waxed, or otherwise rendered nonabsorbent, and the walls should be painted. Wire screens and new window shades should be supplied; also fixtures to open and close transoms.

New ice boxes of the best sanitary construction should be purchased, and especial attention given to kitchen, dining room and cupboards.

Water closets and bathrooms should be entirely torn out, enlarged and rebuilt. The wood composing the present closet floors and the wood of partitions and wainscoting should all be burned. Nothing but slate or tile floors and wainscoting should be considered. Inspection will determine whether or not the present porcelain urinals, hoppers, flush tanks and such apparatus should be discarded or used. In reconstructing the closets and bathrooms, better lighting and ventilation should be secured.

Management of the Hospital.—The surgeon or superintendent should be given complete control, and appeals permitted only in cases which do not belong to medicine. His orders should be absolute. At present the nurses are not organized nor directed. They do almost as they please. They should, of course, be under intelligent direction. Complete and accurate card records should be kept of every case of sickness, and these records filed and always accessible. The indefinite, incomplete and unfiled sick records constitute severe criticism of the hospital management. A microscope and apparatus for making tests and examinations necessary for making accurate diagnoses are an absolute necessity. Their absence in a modern hospital is a greater absurdity than the absence of beds, for even the sick can lie upon a floor, but no man can positively diagnose certain diseases without a microscope and proper apparatus.

The food for the aged and sick, taken as it is from the common supply of the kitchen, is unfit. A simple and abstemious diet is absolutely required if the law of nature in regard to the nutrition

of the aged and sick is to be obeyed. Disaster will certainly follow unless diet is guarded. We therefore recommend that diet be given careful consideration.

RESTAURANT.

The restaurant is unsanitary, and as it now exists it might at any time play an important part in disseminating disease. It therefore should be torn down and a proper building, with cement floor and good drainage, provided. Rules for its sanitary conduct should be passed.

TUBERCULOSIS.

Without making special inspection, Dr. Knabe found seventeen cases of tuberculosis at the home. There are doubtless as many more. Anyhow, seventeen are enough, and demand sanitary attention. These cases are not under supervision, and no doubt their apartments are infected, and very likely they spit at random in the grounds. This means the disease will spread, and unless preventive measures are taken, it means, further, that the home will become a place to be avoided. We therefore recommend that a careful tuberculosis inspection be made, to discover every case of the disease. The cases should then be assembled into an hospital and proper rules for the sanitary care of the malady enforced. If the tuberculosis patients be distributed over the institution it will be impossible to give them proper treatment, and also impossible to effectively provide against the dissemination of the disease.

SANITARY RULES.

We suggest the adoption and enforcement of the following sanitary rules, or of rules including the principles set forth therein:

1. Every inmate, not bedfast, shall every day, meteorological conditions permitting, spend not less than two hours in the open air, the attending physician to fix the minimum time for each patient.
2. The ventilation of all rooms shall be according to the physician's orders, and penalties he may impose.
3. Beds shall be laid open and aired for not less than one hour every morning before they are made up, and mattresses, blankets, quilts and pillows shall be aired in the sun, weather permitting, at least once each week.

4. Wearing apparel shall be aired in the sun, weather permitting, at least once each week.

5. Every inmate shall have a tub bath at least once each week, and as often as they may wish.

6. Washstands, sinks, water closets and bathrooms shall be cleaned and disinfected every day. No refuse, or fruit peelings, apple cores, pieces of food, etc., shall be thrown into the water closets or sinks.

7. Mops, buckets, scrub cloths, brooms, brushes and all cleaning utensils shall be washed and disinfected after using every day, and then exposed to the air and sun. All soiled clothes, papers and trash shall be destroyed by fire.

8. Spitting upon floors, stairways or sidewalks is forbidden. Tuberculosis patients shall carry paper cups or sputum flasks to spit into, said cups to be burned and flasks to be boiled or placed in strong disinfectant. When coughing, tuberculosis patients shall hold a paper napkin or handkerchief before the face.

After due consideration, this report was adopted, ordered spread of record and that a copy be sent to the Commandant of the Soldiers' Home at Lafayette.

After due consideration the following rules were formally adopted by unanimous vote:

RULES OF THE INDIANA STATE BOARD OF HEALTH GOVERNING CHEMICAL ANALYSES AND PATHOLOGICAL AND BACTERIOLOGICAL EXAMINATIONS.

"The State Laboratory of Hygiene shall be at Indianapolis and shall be used for making analyses of foods and drugs for the purpose of enforcing the pure food and drug laws, for making sanitary analyses, pathological examinations and studies in hygiene and preventive medicine to aid in the enforcement of the health laws, and for no other purpose. All work done in the State Laboratory of Hygiene shall be exclusively for the public benefit and no fees shall be charged."—Acts 1905. Chapter 38, Sec. 2.

WATER, FOOD AND DRUG ANALYSES.

Rule I. When possible, all samples of foods and drugs shall be original packages, and when impossible, as in the case of cheese, milk, etc., samples may be sent after making into secure plainly

labeled packages. The quantity of bulk goods shall be not less than eight ounces and liquids not less than one pint.

Rule II. All samples must be attended by an affidavit stating their origin and reasons for making analysis, and clearly setting forth any pertinent facts concerning the same, and according to the rules of the State Board of Health governing the same.

Rule III. Upon request of any health officer or licensed physician, sanitary water analyses will be made as follows, to wit: (1) A request clearly stating reasons shall first be submitted, and if satisfactory to the executive officer of the Board, a shipping case will be forwarded to the applicant. Said shipping case shall contain blank forms for records and full directions for collecting, sealing and shipping. (2) Unless samples are collected in official containers, strictly according to directions, and unless all blanks are fully filled out, analysis and report shall not be made. (3) Express shall always be prepaid, otherwise analysis shall not be made.

PATHOLOGICAL AND BACTERIOLOGICAL EXAMINATIONS.

Rule IV. Diphtheria cultures, sputum examinations and blood examinations for the diagnosis of malaria and typhoid fever, shall not be made unless specimens are collected in the special outfits furnished by the State Board of Health, and not then unless the directions for collecting are strictly followed and the information blanks are fully filled out. Approved outfits may be secured directly from the State Board; also from local health officers or established stations.

Rule V. Bacteriological examinations of samples of waters shall not be made unless the said samples are collected in the outfits furnished by the State Board, according to the directions accompanying said outfit, and not then if the accompanying information blanks are not fully filled out and properly signed.

Rule VI. Pathological specimens, such as curettings, samples from tumors, cancers, pathological fluids, etc., shall not be examined unless collected, preserved and sent according to the conditions and directions obtainable by correspondence with the board.

Rule VII. The charges for transportation of all packages sent to the State Laboratory of Hygiene shall be prepaid; otherwise they shall not be accepted. Reports of analyses and examinations

shall always be sent by mail, but if requested, results will be telephoned or telegraphed at the expense of those making the request.

Rule VIII. No analyses or laboratory examinations shall be made which are not related to or of importance to the public health.

The following instructions to inspectors were adopted:

INSTRUCTIONS TO INSPECTORS.

It shall be the duty of inspectors of the State Board of Health Laboratory of Hygiene (1) to collect samples of foods, drugs and water for analysis; (2) to inspect dairies and all places where food products are manufactured or prepared; (3) to confer with local health officers in regard to the proper enforcement of the pure food and drug laws; (4) to aid them in collecting and shipping samples of water from public supplies; (5) to inspect the water-sheds, settling basins, reservoirs and filter beds of public water supplies; (6) to assist local officials in prosecuting violations of the food and drug laws; (7) to make daily reports to the State Food and Drug Inspector, from whom they shall receive all orders.

Inspectors shall conduct their examinations quietly and in such a manner that no antagonism will be aroused against their work. They will remember always that it is the policy of the laboratory to co-operate with manufacturers, wholesalers and retailers in securing pure goods, and that it is never desirable to prosecute offenders unless they have wilfully violated the laws.

Inspectors will make collections of food samples in the following manner: All samples of foods and drugs will be securely sealed, if not in an unbroken original package, and given a serial number; this serial number will be noted in the inspector's book, together with name of manufacturer, retailer, town and county, brand, and any other information that is necessary to identify the sample. This data will be kept in duplicate, and each day copies of descriptions of all samples collected will be forwarded to the laboratory. The original copy will remain in the possession of the inspector. All prosecutions shall be brought by the State Food and Drug Inspector for the State Board of Health.

Samples shall be sealed and shipped by express to the laboratory as often as may be necessary, and receipts from the express company will be retained by the inspector, and filed at the laboratory.

When samples of foods and drugs are paid for, a receipt shall be taken from the dealer and numbered to compare with the sample number.

In collecting samples of foods and drugs, duplicate sealed samples shall be left with the dealer if he so requests.

Samples of liquids and bulk goods, such as vinegar, molasses, milk, flour and sugar, etc., must be securely sealed before they leave the hands of the collectors, preferably in the presence of the dealer.

Collectors shall keep a careful itemized account of their expenditures of food products to ascertain whether or not they are cleanly trip, and no expense incurred by inspector shall be paid unless accompanied by properly signed receipts.

INSPECTION OF DAIRIES AND FACTORIES ENGAGED IN THE MANUFACTURE OF FOOD PRODUCTS.

It shall be the duty of inspectors to visit dairies and manufactories of food products to ascertain whether or not they are cleanly and conducted in a wholesome, sanitary manner. Whenever conditions are not satisfactory to the inspector he shall at once report such findings to the Secretary of the Board.

INSPECTION OF MEATS, FRUITS AND VEGETABLES.

Inspectors shall visit markets, butcher shops and fruit stands and examine the goods handled therein to see if they are in a pure and wholesome condition. Meats, fruits and vegetables that are in an unfit condition for consumption shall be condemned and the facts reported in writing to the prosecutor of the district and to the local health officer.

Telephone.—The Secretary asked for permission to extend the New telephone to his desk and to the laboratories, and also asked to have the old telephone put in again, with extensions, the same as for the New telephone. After discussion it was agreed that the matter be left to Drs. Wishard and Hurty, they being empowered to take such action as seemed right.

MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.

President Davis suggested that the Board should be represented at the annual meeting of the American Public Health Association, to be held in Boston, September 25th to 30th. After discussion, Drs. Eisenbeiss, Tucker and Hurty were appointed to represent the Board, their expenses to be paid from the general fund.

Adjourned.

REGULAR QUARTERLY MEETING.

October 27, 1905.

Affairs of the fourth fiscal quarter and of the third calendar quarter considered.

Called to order at 2 p. m.

Present: Drs. Davis, Wishard, Tucker, Hurty.

The minutes of the last regular meeting and the minutes of the special meeting of September 6th read and approved.

REPORT OF SECRETARY FOR QUARTER.

This quarter is notable for the opening of the Chemical laboratory. Owing to a series of set-backs, principal among which was the inability to secure a room, the Bacteriological Laboratory is not yet quite ready to commence work. The law creating the Laboratory of Hygiene, passed at the legislative session of 1905, went into effect in April. Immediately efforts were put forth to secure rooms in the State House for the laboratories, as the law commanded. It was found this was a matter of some difficulty, and after negotiations and conferences with other boards and officers in the State House, and much moving around, suitable rooms were found. Prof. H. E. Barnard, of Concord, N. H., was engaged as chemist, and Mr. H. E. Bishop, of Indianapolis, as assistant chemist. Dr. T. Victor Keene, of Indianapolis, was engaged as bacteriologist, and Dr. Helene Knabe as assistant. Some of the equipment has been imported, for it was found upon investigation that money could be saved thereby and probably better wares secured. I feel positive that before another year has passed the

evidence will be at hand to show that these laboratories have done a good work and been of great service to the people, and in this way also a credit to the State Board of Health.

SECRETARY'S VISITS.

.During the quarter the Secretary made nine visits, as follows:

July 11th, Columbus, account smallpox and water supply.

July 12th, Nashville, account smallpox and general sanitation.

July 27th, Eaton, account unsanitary schoolhouse.

July 28th, Auburn, account invitation of mayor.

July 29th, Fort Wayne, account unsanitary jail.

August 14th, Soldiers' Home, account typhoid fever.

August 21st, Martinsville, account typhoid and invitation of mayor.

August 22d, Danville, to address teachers' institute.

September 5th, Anderson, to address teachers' institute.

EATON, AUBURN, FT. WAYNE.

Eaton.—July 27th I visited Eaton, on account of a request from the health officer of that place and the school board. Upon arrival I was met by the county health officer, Dr. Cowing, and the city health officer, Dr. Atkinson, and also the school board. We visited the schoolhouse and fully considered its sanitary conditions.

It is an old brick structure, without basement. Additions have been made from time to time, and access to some parts is made through occupied rooms. None of the rooms are sufficiently and properly lighted, and heating is accomplished by ventilating heaters. The floors and desks, as a rule, were in good condition, but in some rooms this was not the case. From all considerations, the schoolhouse is certainly unsanitary, and should be abandoned. After conference of the trustees it was determined to take no action this year, for they promised that next year a new schoolhouse, modern and sanitary in every respect, would be built. It was obviously impossible to construct such a house this year, because time did not permit. It was therefore agreed that unusual care and pains would be taken in regard to ventilation and giving the pupils outdoor exercise this winter, and also that in certain rooms which were specified, corrugated glass would be used to diffuse daylight to the further parts of the room.

Fort Wayne.—This same visit led me to Fort Wayne, to inspect the sanitary conditions of the Allen County Jail. On arrival I called upon the sheriff, and he took me all over the institution. The building is very old, having been built in 1873, and at the present time is wholly inadequate for the population of Allen County. There are forty cells, and at the time of the visit there were forty-three prisoners. The closets and urinals were in very bad repair, and, owing to the dilapidated condition of the building, it is hardly likely they could be put into proper condition. The washing facilities for the prisoners always have been insufficient, but might be improved. There was only one bathtub for the entire building, and there were eight washbowls, and the enamel had been knocked off in spots from all lavatory appliances. The dining room, which is 33x18x12, has four windows, 2x7, opening into the open air, and one other window of the same size opening into a court. When this dining room is filled with prisoners the air very quickly becomes foul, and even on the brightest days artificial light must be used. This amounts to feeding the men in a dungeon, and is, of course, unsanitary and wrong. There is a hospital ward for men, but none for women. The men's hospital is directly over the dining room, and contains four cells, besides space outside for beds. It is lighted by four small windows, 2x7, which are partially closed by grating. There is no ventilation of the cells except through the room, and the room itself can not be one-half ventilated. The attending physician said that when occupied, the cells got exceedingly foul, and in many instances coughs, colds and other maladies of the respiratory tract have been engendered, and so these cells are not used when it is possible to pass them by. In this hospital there is one old iron bath tub, with the enamel cracked off in various places, which makes it impossible to keep it clean.

The women's ward is 20x24x12. A partition in one corner makes a bathroom and a closet. This closet has no ventilation. The room has four small windows, 2x7, and it makes it impossible to change the air with sufficient frequency. In this ward are placed women of all characters and grades. At the time of my visit an epileptic, perfectly sane and of delicate bringing-up, was confined with the roughest of characters.

The kitchen is in the basement. It is very dark and has three little windows, 20x20 inches. The sewer pipe from the jail leads

under the kitchen, and the jail trap connection in the floor furnishes frequent opportunity for regurgitation of sewage into the kitchen. The sheriff's wife testified that in rainy weather it was a frequent occurrence for the sewage to be one inch deep in the kitchen, making it necessary to lay boards on the floor, so that the employes could go around without wetting their feet in the abominable ooze. There is only one cure for the jail of Allen County, and this is to build a new one, and this was urged upon the commissioners.

Auburn.—On this same visit I went to Auburn. This was in accordance with repeated invitations from the mayor for advice from this department in regard to general sanitation of the town. Upon arrival Mayor McClellan met me, and together with the health officer, Dr. Fitch, we commenced our investigations. Auburn is a very attractive and flourishing city. It is provided with several miles of paved streets and a partial sewer system. The mouth of the main sewer is not low enough and empties too near the town into a creek. It would be very costly, indeed, to lower the mouth of this sewer and to carry it further away, and so it is not likely this will be done very soon. The mayor and people think, however, that this is a very necessary measure. The waterworks are owned by the city, and also the electric light plant. The water is drawn from deep wells, and there is no objection to the supply except that it is very hard and contains iron. Analysis shows it to be organically pure. The inspecting party rode through many alleys, examining sanitary conditions in the rear of homes. We found many instances where cleaning up was necessary, and immediate orders were issued, which I presume were obeyed.

In the evening I addressed a called meeting of the citizens in the court house, upon "General Sanitation." Many questions were asked, and a resolution of thanks was passed.

COLUMBUS AND NASHVILLE.

Columbus.—On July 11th I visited Columbus and Nashville, and was accompanied by Prof. H. E. Barnard, chemist. The visit was made on account of smallpox, and to address a citizens' meeting upon "General Sanitation." The smallpox district was in-

spected for the second time, for I had been to Columbus on a smallpox quest two weeks before. The measures instituted for the suppression of the disease had been very successful, for in the two weeks' time only three new cases had developed. At the time of my first visit, as was heretofore reported, general vaccination was practiced. In the evening the public hall was comfortably filled with citizens, and in the audience was Lieutenant-Governor Miller and State Fish and Game Commissioner Sweeney. The principal subject of interest was "A New Water Supply for Columbus." Some citizens favored wells and others favored filtration of the water, which is now taken from the east fork of White River. I advocated filtration, for this would give to the city a soft water, and if the filtration was carefully attended to, it would insure a pure supply. I learned since our visit it has been decided to put in a filter plant.

Nashville.—On July 12th we drove to Nashville, the capital of Brown County. On the way several schoolhouses and farmhouses were visited. At the latter, sanitary inspections and suggestions were made and health circulars distributed. At Nashville the health officer and the chairman of the town board met with us, and many suggestions were made to better sanitary conditions of the town. Upon return, five houses infected with smallpox were inspected. One of these deserves special mention.

The house was situated in a ravine one-half mile from the road, and it was necessary to walk down a gully badly cut by the rains to get to it. It was a log house of one room and sheltered seven people, father and mother and five children. All had smallpox. There were three beds, two double beds and one single bed. How seven people found rest in these three beds is a problem that is unsolvable. Two of the members of the family, the mother and oldest daughter, were up and around, but quite sick with the disease. The ventilation was very excellent, for at various places it was an easy matter to put one's hand and arm between the logs, and in many places it was possible to look out through the roof at the open sky. The floor was broken and the furniture of the houses consisted of three chairs, an old table and a broken stove. The kitchen utensils were very few, and the table furniture, mostly tinware and cracked crockery, in all were very few pieces. All of the patients seemed to be getting along well, and the only sug-

gestion made to the health officer was that the building, after the course of the disease had been run, should be destroyed, with all it contained and the clothes of the patients, and that they be resupplied, after disinfecting baths.

DANVILLE.

August 22d I visited Danville to lecture to the Teachers' Institute. These institutions furnish most excellent opportunities to disseminate the gospel of hygiene. My address of forty-five minutes was kindly received, and many questions were asked and a vote of thanks passed.

ANDERSON.

On September 5th I visited Anderson, in order to address the teachers' institute. Over two hundred teachers were present. My subject was, "How May Teachers Help in the Work of Disease Prevention?" The address was well received and a vote of thanks offered.

INDIANA STATE SOLDIERS' AND SAILORS' HOME.

On August 14th, together with Mr. Marshall O. Leyton, of the United States Geological Survey, I visited the Soldiers' Home at Lafayette. This visit was upon invitation from the farmers and the commandant of the Home, because of typhoid fever, which existed there. Upon arrival, a preliminary investigation was made of the grounds in general and of each building. It was found there had been four cases of typhoid fever, one fatal. The records of the hospital were examined, and from them it was apparent the disease had existed in mild form for some time. Complete and full report of this investigation was made to the Board at the special meeting held September 6th, and will be found recorded in the minutes.

MARTINSVILLE.

August 21st I visited Martinsville, on account of special invitation of the mayor and the health officer, to confer with the council as to what should be done in sanitary work in the city. Upon arrival, the mayor and the health officer, Dr. Tilford, took me in a carriage first to the waterworks, then through numerous alleys,

and finally to view the condition of White River. The Martinsville water supply is from deep wells, and the plant is situated within the city limits, and is surrounded by dwellings. The supply at the present time is of good quality, but even superficial examination discovers it is liable to become polluted at any moment. Analyses were made which prove the present purity of the supply. Seven cases of typhoid fever existed at the time of the visit. The houses where these cases prevailed were examined, and in every instance local conditions which could produce typhoid fever existed. Directions were given to remove the same by cleaning out vaults, condemning wells and general cleaning up of premises, and the proper sanitary care of the patients.

The examination of White River at this point was indeed interesting. From the bridge the yellowish green water, with small floating islands of scum and the odors arriving therefrom, told a plain story. The river is very foul, and this foulness is caused by the sewage from the city of Indianapolis, about forty miles above. As is well known, Indianapolis discharges all the sewage of two hundred thousand people into White River. Only upon rare occasions, when the river is very high, can it be said that the stream is other than a foul, noisome and open sewer. In the evening, before the council, all of these subjects were discussed, and through the city attorney it was plainly made known there was, under the present laws, no relief from the pollution of White River by Indianapolis. However, there was relief for the other conditions, and the county council was advised in detail as to what was to be done.

On account of a severe attack of articular rheumatism, the Secretary was unable to attend the meeting of the American Public Health Association at Boston, as directed by the Board. Dr. F. A. Tucker attended, and his report is given herewith. October 12th and 13th I attended the Second General International Sanitary Congress. The sessions were held in the Willard Hotel, at Washington, and were continued over four days, commencing Monday, October 9th. Representatives were present from many of the South American States. The subjects most generally discussed were of tropical diseases and quarantine. Yellow fever was the principal subject, but plague and beri beri were thoroughly considered. A notable paper was read by Dr. M. Moore, president of

the National Board of Health of Chili. This paper was of a general nature, treating of the sanitary affairs of South America.

The report of the work done in the chemical laboratory during the quarter is appended, also reports of Drs. Knabe, Newcomb and Brayton.

REPORT OF CHEMICAL LABORATORY.

The establishment of the laboratory has occupied all of the time for the last four months and we are only now in the position to undertake successful analytical work. Because of the great saving of expense, the greater part of the chemical apparatus was ordered abroad and reached the laboratory only last week. The laboratory is at present well equipped with new and suitable apparatus, chemicals, laboratory benches, cases and fittings, so that the cost of supplies during next year will be slight.

For the past two months Mr. L. W. Bristol has been acting as deputy food inspector and has visited for the laboratory nearly all of the large cities and towns of the State. His collections have included samples of milk from dairies and retailers, and food products from markets and grocery stores. He has sent in up to the present time 1,089 samples of food, of which we have examined 294 samples of milk and 103 samples of meat and fish products. Fifty-four, or 18.5 per cent., of the milk samples examined have been found to be adulterated either by means of added preservatives, or skimmed, or diluted by the addition of water. Of the 103 samples of meat products, 56, or 54.3 per cent., have been found to be adulterated by the addition of borax. There is evidently no doubt but what we can regulate the sale of milk in the State with little difficulty. It will, however, be necessary to keep inspectors constantly going the rounds of cities and towns to insure this end.

In order that manufacturers, wholesalers and retailers of meat products might well understand our pure food law and be ready to act in accordance therewith, we have sent from the laboratory copies of the July issue of the Bulletin, which contained the pure food and drug law of the State, to all the wholesale grocers and meat packers of Indiana, as well as to the larger meat packers of the country whose goods are very generally found on our markets. It is gratifying to report that wholesale grocers and packers, without exception, express themselves as in favor of the strict enforcement of the law, they apparently realizing fully the advantage they will have over dishonest competition, if the sale of adulterated goods can be effectively controlled and the quality of the goods on our markets raised to a high standard of purity.

During the last month Mr. Burt W. Cohn has acted as deputy food inspector and has confined his work to the collection of samples of drugs. He has visited a large number of the cities and towns and has sent into the laboratory 1,752 samples. In his collections he has endeavored to purchase articles most commonly adulterated, such as fluid extracts, dry chemicals, patent medicine, etc. We have as yet been unable to take up the analysis of these goods, but I hope in the near future to be able to report the results of our first inspection of the drug stores of Indiana.

During the last two weeks I have analyzed 85 samples of water and have reported their condition to the proper authorities. Of this number of water samples, chemical analysis shows 41, or 48.2 per cent. to be impure, either heavily contaminated by sewage or surface wash, and in this case advice has been given that the supply be discontinued as a source of drinking water.

It seems advisable to attempt a control of the public water supplies of the State, and as a step in this direction I have sent out blanks to every health officer asking for information concerning the water supplies of his town. There are probably about 150 supplies in Indiana. At the present date we have heard from 266 out of the 341 letters sent out. As soon as we can complete our list of towns and cities, we shall systematically examine samples of water from these supplies, endeavoring to make the examinations four times a year. The widespread prevalence of typhoid fever, undoubtedly largely due to contamination of water supplies, is sufficient reason for carrying on this branch of our work with much vigor.

REPORT OF TYPHOID FEVER IN UNION COUNTY.

By Dr. Knabe.

Obedying an order from your honorable body, I went to Liberty, Indiana, October 3d, to investigate an epidemic of typhoid fever in Union County. After a careful study of the existing conditions I desire to submit the following report:

Within the past ten weeks thirty-one (31) cases of typhoid fever have occurred in Union County. Infection was brought there by William Reilly Beck, 64 years of age, who, having been ill for some time at his former home in Missouri, came to stay with his son, Robert Beck, July 10th, 1905. The illness continued for some time after his arrival, but no physician was employed and the patient was cared for by members of the family.

At the end of July, Robert and his two sons, 13 and 4 years old, became sick. A physician was consulted, who made a correct diagnosis, but reported, however, only two cases. No report was sent for Ralph Beck, age four years, who was severely ill, presenting all the symptoms of typhoid fever, as I ascertained by questioning his mother.

About the same time Charles Beck, a brother of Robert Beck, contracted the disease, and since then the spread of the infection has become general. Through the extremely filthy practices indulged in at the patient's house the well became infected, and of twelve men who drank the water from this well, eight are now sick with typhoid fever, some of them severe cases. From these eight cases five others developed by direct infection. Other relatives of the Beck family who had visited the patients and assisted in caring for them became also infected, and now typhoid fever is present in seventeen farmhouses. In two of the cases I was unable to trace the connection with the patients mentioned above. Many of the cases were of moderate severity and medical aid was not sought. Still other cases were diagnosed by the attending physicians as "malarial fever," "bilious fever," and "malaria and flux." In some instances where the correct diagnosis had been made, reports were not sent to the health officer until the patient was convalescent. Three reports, dated September 15.

1905, came in October 5th and 6th, respectively. Nurses are rarely employed. I found them in five families only. In all of the lighter cases disinfectants had not been used at all, and in the other families, except where a nurse was in charge, the quantity of disinfectants used was wholly inadequate, they might as well have used plain water.

As to the conditions prevailing on some of the farms, they are filthy beyond measure.

The farm rented by Charles Beck, owned by Wilson Wheeler, of Liberty, Ind., is situated on a hill. The house is old and badly kept. Five feet from the house to the rear, is the cistern; a little farther away the dug well, covered with decaying boards and generally in a very dirty condition. Within three feet of this well stands a little shed used for storing vegetables, etc. When I inspected it, it was swarming with flies, attracted there by the rests of decaying vegetables, etc., which were in abundance. The roof of this shed, as well as the floor of the front porch, were used to spread apples for the purpose of drying them, a most loathsome sight, for the flies covered them so thickly that the apples could scarcely be seen. This farm is well supplied with water; three wells, one of them a sulphur water, and one spring leaving the ground about seventy feet from the house. Over this spring a small house is built, which serves as the storing place for milk, butter, etc.

Situated fifteen feet from this milkhouse and on a level higher than this spring, and also the dug well which so rapidly spread the infection, is the privy, and no disinfectant was used around the place for several weeks. As a rule the excreta were simply thrown around the well on the grass. Under a tree in the farm yard I found an open separator, partly filled with sour cream and numerous flies; the cream was to be churned the next day. A few feet away from it I noticed a milk can filled with water, and on inquiry was informed that it was boiled water, and put out there for the farm employes to drink. The lid was not closed and dozens of flies had fallen in and drowned there. I ordered them not to use any of the apples, cream or water that had been infected with flies, but the negligence and carelessness, coupled with avarice, makes it nearly impossible to achieve satisfactory results for any length of time.

Dr. Kell, the health officer of Union County, had visited a ravine north of the house a few hours before I arrived at the place and he stated that he found six dead chickens and two dead cats there in various stages of decay. On some other farm where typhoid fever was present I heard that the hogs began to show signs of a disease resembling hog cholera. As a rule the hog pens are very near the houses and it would not be unreasonable to suppose that some infection might be spread to the animals also.

On another farm which I visited the well was within three feet of the house, and a short distance away a large hole of considerable depth had been dug with the intention of making a cistern, but subsequently abandoned. The water, collecting here, drained back into the well, which in itself was unsanitary enough, covered as it was with decaying boards that were scarcely sufficient to support the old wooden pump overgrown with moss and algae. The careless way in which things had been conducted in this family was appalling.

On one farm the well, from which the water had been used for drinking, stood practically in a manure pile. The ground around the well was

very soft for quite a distance and soaked with the fluids from the stable. There was one other well on this farm, but the water was in so bad a condition that smell and taste would not permit anyone to use it, even boiled. The owner of this farm had refused to do anything to secure a better water supply.

The conditions which I have mentioned occur on practically every farm with more or less variation. Regarding the diagnosis of those cases of typhoid fever, I wish to mention that I obtained a specimen of blood from every suspicious case, and on returning to Indianapolis applied the Widal test with positive result in every case, nine in all.

During my visits in the infected houses I endeavored to point out the unsanitary conditions to the residents, advising in each particular case how best to remedy them.

Whenever this was possible I met the physician in charge and assured myself that he gave the case sufficient attention to prevent the further spread of typhoid fever. I also used every opportunity to see the residents of farms near those where the fever prevailed, pointing out to them the dangers that might arise and warning them to be careful of their water supplies, etc. I sent fifteen samples of water to the State Laboratory of Hygiene for chemical examination, and every one of these samples was found to be polluted in varying degrees.

On the last day of my stay at Liberty I inspected a large part of that town, and came to the conclusion that if any cases of typhoid fever should occur in the town itself there might follow an epidemic of considerable gravity before it would be possible to stamp it out again. Many of the lots are very small, yet each house has its own well, and all the wells, with a few exceptions, are dug and are very shallow. They are also entirely too near the privies, and all the contents of the latter stay on the surface, so that even a moderate amount of rain would probably pollute the majority of the wells in the town.

There are two lines of sewer, but they are not used to carry off filth of that kind.

Liberty, a town of 1,800 residents, has also waterworks, but this water is used only by a very small portion of the populace. A sample of water which I collected from the faucet in the kitchen of the New Corrington Hotel was found to be of poor quality and not fit for drinking purposes.

The conditions at the Liberty High School were also far from sanitary, and before leaving the town I saw some members of the board of trustees and informed them of the existing danger.

Taking the situation altogether. I believe that the epidemic is now well under control, as physicians and laity are aware of the fact that they alone will be responsible for any new outbreak. There are several persons who have partaken of the water from the infected well, and may now be in the period of incubation. Perhaps three or four cases may yet appear before the epidemic will have died out.

YELLOW FEVER AT MARION.

Report of Dr. Nelson Brayton. In answer to a telegram from the county health officer and a letter from the city health officer at

Marion, Dr. Brayton was directed to visit the city, make investigation of the supposed yellow fever case and take such action as seemed proper.

October 10, 1905.

Indiana State Board of Health:

On Friday, October 6th, I visited at Marion, Ind., Horace Myers, a young man aged 20 years, who had come direct from Enola, La., a yellow fever infected parish, and where he had been exposed to the disease. I found him with a temperature of 103.2° and a pulse of 106. No albumen in urine; no enlargement of spleen. I saw by the symptoms and history of case that it might be yellow fever and continued the ordinary efficient precautions which had already been instituted by Dr. E. O. Harrold, in screening and caring for the case. In order to reassure the public I made the consistent statements in the public press of the two city papers, the facts therein stated being consistent with our present knowledge of yellow fever and its communicability.

In response to a letter from me directed to Dr. Harrold on Monday, I received a letter on Wednesday announcing the death of Mr. Myers.

Relative to the case I may add that the exclusive theory of mosquito transmission of yellow fever is not accepted by Dr. B. M. Horne, the secretary of the city board of health.

The case was visited at the pest house, about one mile from Marion, where it had been removed. Dr. Harrold did not ask for a nurse when I saw him, as the patient did not at that time seem to need other care than that given him by his brother.

Respectfully submitted,

NELSON D. BRAYTON, M. D.

TYPHOID FEVER AT ETNA GREEN.

I have the honor to submit the following report concerning my tour of duty at Etna Green and vicinity, in pursuance of instructions from Dr. J. N. Hurty.

I arrived at Warsaw, Ind., on Monday afternoon, September 25th, and immediately called upon the local health officer, Dr. Webber, to consult with him concerning conditions in that city. I also called upon Dr. Beckett, county health officer, but was unable to obtain any definite information as to the number of cases in the county or as to their location. The following morning, I drove to Etna Green, Kosciusko County, and called upon Dr. Dunfee, the local health officer. The doctor was not in, and I started down to Etna Green and saw five cases before his return. Upon his return, I received the names of all typhoid cases in Etna Green reported up to date: Ellis Jordan, Mr. La Rue, Marshall Roath, George Burgh, David Waggoner, Mrs. S. N. Van Tilberry, Miss Van Tilberry, Miss Van Tilberry, Mr. Warren Rockhill, Mr. Milton Brindley, Mrs. Milton Brindley, Mrs. Elizabeth Rockhill (died).

In Etna Township the following cases were reported: Fred Jennings, Allen Ford, Charles Ford, Warren Byer.

In Harrison Township: John Boone, Mr. Miller.

7-Bd. of Health.

One point worthy of note is that in every case which I visited, the duration of the illness was from two to three weeks; in the majority of cases, two weeks. Several of these cases are deemed worthy of detailed report:

Case No. 1.—G. H. Burgh, saloonkeeper, aged 27, diagnosed typhoid fever. Physician, Dr. Dunfee. Possible sources of infection: Patient claims that for the past month his entire water supply has been derived from the town pump. Duration of illness, two weeks. Condition of patient, serious. Sanitary conditions: The patient was confined in a small room in an area approximately 9x7 feet. In this room his wife and three children slept. Ventilation was practically nil, everything in the room was in a filthy condition. The excreta was not being disinfected, but was being thrown out in the back yard, which was directly next to a restaurant. Absolutely no precautions were being taken toward prophylaxis and the family were unable to purchase the necessary articles of diet. Dr. Dunfee, the local health officer, had made every effort in his power to improve the condition of affairs, but without much success. On two days previous to my visit, he had hired a man at the expense of the town to clean the back yard and straighten up the house as much as possible. I immediately notified the township trustee of the prevailing conditions and impressed upon him the necessity of providing this family with proper food and of moving the patient into another house. Explicit instructions were also given as to the disinfection and disposal of excreta and of the necessity of boiling all the water.

Cases 2, 3, and 4.—At the residence of Mr. S. N. Van Tilberry, Mrs. Van Tilberry and two daughters were found to be suffering from severe cases of typhoid fever. Duration of illness in each case was two weeks. Sanitary conditions at this residence were excellent. Two trained nurses were in constant attendance and patients were receiving every possible attention. This family has spent the entire summer at home, with the exception of one daughter, who spent two weeks at Lake Winona, showing that the infection was received at home. Five weeks prior to their illness, they had two visitors, who, two weeks after their return home, at Louisville, developed typhoid fever, and three days after development of this disease in these visitors, Mrs. Van Tilberry showed prodromal symptoms of typhoid, and three days later, both daughters were affected.

Case No. 5.—Mrs. Elizabeth Rockhill died September 19th. Case very serious—rapid fatal termination. Death due to weakened heart condition in connection with organic heart lesion. Two guests of Rockhill's from Lafayette developed typhoid fever two weeks subsequent to their return to Lafayette, and one the same day Mrs. Rockhill showed the first symptoms of typhoid. The other cases in Etna Green were rather severe types, but presented no particular points of interest. In all cases, explicit instructions had been left concerning the proper disinfection and disposal of excreta, and in all but three cases I found that these instructions were being carried out. In the cases of Warren Byer, John Boone and George Burgh, no precautions whatever were being taken. In all cases the doctor in charge had left instructions that all drinking water for patients should be boiled, leaving other members of the family unprotected. The necessity of boiling all drinking water for the entire family was impressed upon

them and insisted upon. Samples of drinking water were taken from each residence in which the disease had manifested itself and from other wells which were in any way suspicious. The town marshal was instructed to make a thorough inspection of every vault in the town of Etna Green, and he was authorized by the local health officer to order such changes as were necessary to comply with requirements as specified by Dr. Dunfee. Handbills of instructions concerning the prevention of typhoid fever were ordered for distribution to every home in Etna Township and every precaution for the prevention of any further infection is at present being taken.

The focus of infection was found to be down near the Tippecanoe River in an area extending from one-eighth of a mile to three-fourths of a mile from the bank. Along the river banks there were found many stagnant pools, the result of an overflow which occurred the latter part of July. Much marshy land was found and the conditions were such as to suggest immediately the probability of contamination of the drinking water, due to seepage from the river and surrounding marshes. All the wells in this vicinity are driven wells, varying in depth from 16 to 90 feet, and in age from 6 months to 30 years.

On Wednesday I telephoned to Plymouth, the county seat of Marshall County, and to Bourbon, Marshall County, and to Atwood, and found that there was no epidemic at any of these places. At Atwood a number of cases were reported in the surrounding country, and in the afternoon I drove to Atwood and consulted with the physician in charge of the cases, finding that he was taking absolutely all of the precautions to prevent any further spread of the disease. On Wednesday night, at Warsaw, I saw two cases of typhoid fever with Dr. McDonald, but was unable to determine definitely the source of infection. One of these cases was convalescent, and the other presented the early symptoms of typhoid. I secured specimen of blood and forwarded it to the bacteriological laboratory for the Widal test. It was found to be positive. The patient, Miss Betty Reid, a student in the high school, is positive that she has had no drinking water except that obtained from the driven well at the hotel and from the well at the school building. Samples from both of these were submitted.

On Thursday morning, I drove with Dr. Schoonover to the home of Mr. Miller, in Harrison Township, in which the doctor had several cases of typhoid. Five days prior to this time the daughter had died from hemorrhage on the seventeenth day of the disease. At this time there were five cases in the house.

Case No. 1. Roy Miller, first symptoms August 15th, convalescent.

Case No. 2. Bessie Miller, first symptoms August 25th, died of hemorrhage.

Case No. 3. Earl Miller, 8 years, first symptoms September 7th. On September 28th, temperature 103, pulse 168, respiration 48. Delirium, coma-vigil, subsultus tendinum. On the head, over the occipital protundance, two abscesses. Over the sacrum, a bed sore about three inches in diameter and one on each heel. There was incontinence of feces and urine, and complete retention of urine, requiring catheterization. The anterior neures were excoriated and bleeding, there were sordes on the teeth, the tongue was covered with black scales, as were the lips. For two days it

had been very difficult for the boy to swallow, due to the swelling of the tongue and throat.

Case No. 4. Ralph Miller, agd 10, first symptoms September 18th, case severe.

Case No. 5. Mrs. Miller. first symptoms September 26th, condition satisfactory.

Case No. 6. Baby, aged 2 years, temperature 103, diarrhoea and other very suspicious symptoms.

The conditions in and around this home were very unsatisfactory. The house was dirty, there being no protection from flies, and evidently no measures taken toward rectifying the conditions of filth which existed. The only attendants these patients had were the father and a farmer's wife. Instructions had been left by Dr. Schoonover concerning the disinfection and disposal of excreta and were in a measure being followed out. The soiled bed clothing and towels had been deposited on the back doorstep and were covered with flies, which had ready access to the house. The father seemed to be unable to realize the importance of proper disinfection of bed clothing, etc. Within one hundred yards of the house, extending across the road, was a "sink-hole." The doctor informed me that seven bridges, one after another, had sunk into this hole, the school-house to the right of these bridges had disappeared in like manner, and the farmers, after repeated efforts, had claimed it was impossible to determine the depth of this sink-hole. Fish were found in it, and considering its size, 50x30, it seems probable that it had direct subterranean connection with either the Tippecanoe River or one of the lakes in the surrounding country—the nearest body of water being one and three-quarter miles distant. The driven well on the Miller place is 65 feet in depth and about 100 yards distant from this sink-hole.

Dr. Schoonover had made every effort to find a nurse to take charge of this family, but without success, and it was impossible for them to obtain any assistance from the neighboring families, as the belief had gained credence that it was unsafe for them to enter the house. The condition of affairs here was most deplorable, and at the time there seemed to be no way in which it could be improved.

On Thursday afternoon, at the request of two members of the board of directors of Lake Winona, I went there to consult with Dr. Dickey concerning the sanitation of the Assembly grounds. Upon inquiry, I found that there is no adequate system of sewage, and considering the number of people—between 7,000 and 8,000 at one time—who reside at Winona during the summer months, it seems necessary that some more satisfactory arrangements be made. At present there are a number of vats on the grounds, with each of which a certain number of houses are connected. All of the sewage is carried to these vats, which are emptied when necessity demands and the contents carried away by a specially constructed wagon to farms from one-half a mile to a mile and a half back of the Assembly grounds. Here this effete material is spread out on the ground and employed as fertilizer. In course of time, this method would undoubtedly jeopardize the health of the residents of the Assembly grounds, and, considering the nature of the ground, it would only be a matter of a short time until the usually profuse natural drainage would result in the

contamination of the lake and possibly of some of the springs on the ground. I was assured by Dr. Dickey that this arrangement was only temporary and that by next summer direct connection would be had with the sewers of Warsaw. In talking over the matter of sanitation, I recommended that a small hospital, with operating room, be built on the Assembly grounds and that provisions be made to properly care for all surgical cases, there being at present no available building for this purpose. In the course of the conversation, I spoke to Dr. Dickey concerning the sad condition of affairs which I found at Mr. Miller's that morning, and on the following morning I was advised by Dr. Dickey that they had secured a nurse, had provided her with the necessary provisions and had instructed her to report to Dr. Schoonover for instructions concerning the care of this family. The officers of the Winona Assembly did this on their own responsibility and volunteered to pay the expenses. I advised Dr. Schoonover to procure the necessary funds for this service from the township trustee and to see that every necessity be provided for.

On Friday morning samples of water were taken from the four schoolhouses in Warsaw and submitted for examination. A visit was next made to the water works and careful inquiry disclosed the fact that the city water of Warsaw is taken directly from Centre Lake, undergoing no process of filtration or purification. Within 300 yards of the intake pipe of the water works there is a sewer emptying into the lake from the house of Dr. W. L. Hines. Within 75 yards of this sewer are the ice-houses which supply the city of Warsaw with ice. About 500 yards east of the intake pipe, directly on the shore of the lake, is the city dump-grounds, where garbage and other refuse matter is deposited. With every heavy rain some of this matter is undoubtedly carried into the lake, as well as filth from the street, which runs directly down to the lake shore. Upon investigation, I found that Dr. Hines has direct connection with the sewer system of Warsaw, but owing to the fact that this territory is somewhat lower than that of the main sewer, it was found necessary to install a lift-pump in order that sewage from the north end of the town might be forced into the main sewer. After a short period, the use of the lift-pump was discontinued, thus depriving the neighborhood of adequate sewer connection, and it was found necessary to run drain-pipes from the houses to vaults or to the lake. The said water is undoubtedly not fit for drinking purposes, and a sample for analysis was forwarded to the chemical laboratory. I would recommend that the local health officer of Warsaw be instructed to do everything in his power to remedy this condition.

Appended to this report are the results of analyses of water from the following sources:

DRIVEN WELLS.

Etna Green.—Ellis Jordan, no evidence of pollution; David Waggoner, no evidence of pollution; Mr. La Rue, polluted; Mrs. S. N. Van Tilberry, no evidence of pollution; Marshall Roath, polluted; George Burgh, polluted; Mr. Warren Rockhill, polluted; Mr. Milton Brindley, no evidence of pollution.

Etna Township.—Charles Ford, polluted; Warren Byer, polluted.

Harrison Township.—John Boone, polluted; Mr. Miller, no evidence of pollution.

Warsaw.—East Ward Public School, polluted; West Ward Public School, polluted; Center Ward, polluted; High School, polluted; Hotel Hayes, polluted; City water from Warsaw, no evidence of pollution.

Very respectfully yours,

JOHN R. NEWCOMB, M. D.

Moved by Dr. Davis: That the regular annual health officers' school for town health officers be held in Indianapolis, December 14th-15th; that the said officers be regularly summoned, and that the Secretary make up a program and engage teachers, the Board to pay all expenses.

Carried.

Adjourned.

FISCAL REPORT INDIANA STATE BOARD OF HEALTH.

RECEIPTS.

Appropriation \$10,000 00

DISBURSEMENTS.

1904.

Nov. 30.	Alice Christian	\$50 00
" 30.	May Stuart	50 00
" 30.	Maude Linn	50 00
" 30.	Maud Hoffman	50 00
" 30.	Florence Froschauer	50 00
Dec. 16.	Dr. A. W. Brayton	5 00
" 16.	Dr. G. W. Bence	15 30
" 16.	Dr. Burton D. Myers	6 25
" 16.	Dr. Wilmer K. Batt	50 50
" 16.	Dr. J. J. Kinyoun	50 65
" 16.	Dr. Chas. E. Ferguson	5 00
" 16.	Dr. T. Henry Davis	26 30
" 16.	Dr. Wm. N. Wishard	20 00
" 16.	Dr. Clark Cook	29 00
" 16.	Dr. C. M. Eisenbeiss	34 50
" 19.	English Hotel	17 25
" 23.	Indianapolis Calc. Light Co.	7 00
" 23.	Geo. F. McGinnis, P. M.	150 00
" 31.	May Stuart	50 00
" 31.	Alice Christian	50 00

Dec. 31.	Maude Linn	\$50 00
" 31.	Maud Hoffman	50 00
" 31.	Florence Froschauer	50 00
1905.		
Jan. 13.	H. K. Mulford Co.	24 00
" 13.	Parke, Davis & Co.	5 00
" 13.	Smith Premier Typewriter Co.	47 75
" 13.	American Express Co.	1 90
" 13.	U. S. Express Co.	5 95
" 13.	Adams Express Co.	2 39
" 13.	W. U. Telegraph Co.	3 54
" 13.	American Toilet Supply Co.	2 25
" 13.	Wm. B. Burford.	655 28
" 13.	C. R. Anderson	10 00
" 13.	New Telephone Co.	15 35
" 13.	J. L. Anderson	4 20
" 13.	J. N. Hurty, Sec.	64 64
" 13.	Dr. Clark Cook, Prest.	18 00
" 13.	Dr. T. Henry Davis.	14 30
" 14.	Amer. Med. Ass'n Co.	5 00
" 31.	May Stuart	50 00
" 31.	Alice Christian	50 00
" 31.	Maude Linn	50 00
" 31.	Maud Hoffman	50 00
" 31.	Florence Froschauer	50 00
Total		\$2,046 30
Cash balance		7,953 70
		<hr/> \$10,000 00
Balance second quarter.		\$7,953 70
Feb. 9.	Geo. F. McGinnis, P. M.	\$100 00
" 28.	Alice Christian	50 00
" 28.	May Stuart	50 00
" 28.	Maude Linn	50 00
" 28.	Maud Hoffman	50 00
" 28.	Florence Froschauer	50 00
" 28.	Mrs. E. T. Coney.	16 67
Mar. 15.	H. Bennett, P. M.	100 00
" 31.	Alice Christian	50 00
" 31.	May Stuart	50 00
" 31.	Maude Linn	50 00
" 31.	Maud Hoffman	50 00
" 31.	Florence Froschauer	50 00
" 31.	Mrs. E. T. Coney.	50 00
Apr. 6.	Amer. Public Health Ass'n.	5 00
" 6.	Pettis Dry Goods Co.	1 20
" 6.	Durfee Embalming Fluid Co.	7 35
" 6.	Adams Express Co.	2 30
" 6.	Wm. B. Burford.	389 74

Apr.	6.	American Express Co.....	\$4 32
"	6.	U. S. Express Co.....	6 46
"	6.	J. N. Hurty, Subs. British Food Journal...	2 00
"	6.	T. W. Smith, Chemist.....	114 00
"	6.	The Scarborough Co.....	3 00
"	6.	American Toilet Supply Co.....	2 25
"	6.	Western Union Telegraph Co.....	4 21
"	6.	Smith Premier Co.....	3 75
"	6.	Parke, Davis & Co.....	5 75
"	6.	The Wells Mfg. and Supply Co.....	4 75
"	6.	The New Telephone Co.....	21 30
"	6.	Jas. A. Egan, M. D., Sec'y.....	10 00
"	6.	Dr. C. M. Eisenbeiss.....	22 25
"	6.	Dr. T. Henry Davis.....	14 65
"	6.	Dr. Clark Cook.....	16 50
"	10.	F. C. Benton.....	3 00
"	10.	J. N. Hurty, Sec'y.....	80 84
"	10.	Dr. Wm. N. Wishard.....	20 00
"	10.	Dr. Clark Cook.....	16 50
"	10.	Dr. T. Henry Davis.....	14 55
"	10.	Dr. C. M. Eisenbeiss.....	23 00
"	21.	Dr. F. A. Tucker.....	11 20
"	21.	Dr. T. Henry Davis.....	14 65
"	21.	Dr. Wm. N. Wishard.....	10 00
May	1.	May Stuart	50 00
"	1.	Alice Christian	50 00
"	1.	Florence Froschauer	50 00
"	1.	Mrs. E. T. Coney	50 00
"	1.	Ethel Hoffman	50 00
Total			\$1,901 19
Cash balance			6,052 51
			<hr/> \$7,953 70
Balance third quarter.....			\$6,052 51
May	2.	H. W. Bennett, P. M.....	\$100 00
"	31.	May Stuart	50 00
"	31.	Alice Christian	50 00
"	31.	Maude Linn	50 00
"	31.	Florence Froschauer	50 00
"	31.	Mrs. E. T. Coney	50 00
"	31.	Ethel Hoffman	50 00
June	2.	Dr. Jos. McFarland.....	60 00
"	2.	Dr. Seneca Egbert.....	60 00
"	2.	Dr. T. Henry Davis.....	28 45
"	2.	Dr. C. M. Eisenbeiss.....	32 90
"	2.	Dr. Wm. N. Wishard.....	20 00
"	2.	Dr. Fred A. Tucker.....	23 40
"	3.	Dr. Chas. S. Bond.....	16 10
"	3.	Prof. R. Sackett.....	16 10

June 9.	H. W. Bennett, P. M.	\$100 00
" 12.	Dr. T. Henry Davis.	14 00
" 12.	Dr. Wm. N. Wishard.	10 00
" 12.	Dr. Fred. A. Tucker.	11 70
" 30.	May Stuart	50 00
" 30.	Alice Christian	50 00
" 30.	Maude Linn	50 00
" 30.	Florence Froschauer	50 00
" 30.	Ethel Hoffman	50 00
" 30.	Mrs. E. T. Coney.	50 00
July 7.	H. K. Mulford Co.	3 19
" 7.	U. S. Express Co.	1 83
" 7.	Adams Express Co.	46
" 7.	American Express Co.	1 35
" 7.	Bobbs-Merrill Co.	2 87
" 7.	Indianapolis Calcium Light Co.	5 00
" 7.	To Crossett & Bates "Pediatrics".	2 00
" 7.	Wm. B. Burford	981 95
" 7.	5 Directories Tuberculosis Sanatoriums.	4 50
" 7.	To Lea Bros. & Co., book.	5 00
" 7.	American Toilet & Supply Co.	2 45
" 7.	Dr. Wm. N. Wishard.	122 50
" 7.	Dr. J. N. Hurty.	107 47
" 7.	J. L. Anderson.	10 02
" 7.	Dr. F. A. Tucker.	90 70
" 7.	New Telephone Co.	18 75
" 7.	Western Union Telegraph Co.	2 68
" 7.	George J. Mayer.	1 00
" 7.	Claypool Hotel	6 70
" 7.	J. A. Egan, Sec'y.	10 00
" 7.	Dr. T. Henry Davis.	13 70
" 7.	Dr. C. M. Eisenbeiss.	22 00
" 7.	Henry W. Bennett, P. M.	100 00
" 31.	May Stuart	50 00
" 31.	Maude Linn	50 00
" 31.	Florence Froschauer	50 00
" 31.	Alice Christian	50 00
" 31.	Ethel Hoffman	50 00
Total		\$2,858 77
Cash balance		3,193 74
		<hr/> \$6,052 51
Balance fourth quarter.		\$3,193 74
Aug. 31.	May Stuart	50 00
" 31.	Maude Linn	50 00
" 31.	Florence Froschauer	50 00
" 31.	Alice Christian	50 00
" 31.	Ethel Hoffman	50 00
" 31.	Bobbs-Merrill Co., gummed letters.	34

Aug. 31.	Geo. J. Mayer, rubber stamp.....	\$0 20
Sept. 6.	H. W. Bennett, P. M.....	100 00
" 6.	J. N. Hurty	4 03
" 6.	J. L. Anderson.....	3 40
" 6.	The Schofield-Pierson Co.....	1 00
" 6.	American Express Co.....	28
" 6.	U. S. Express Co.....	55
" 6.	Wm. B. Burford.....	123 07
" 6.	Dr. C. M. Eisenbeiss.....	18 50
" 6.	Dr. T. Henry Davis.....	14 45
" 6.	Dr. F. A. Tucker.....	11 45
" 6.	Dr. Wm. N. Wishard.....	10 00
" 6.	Dr. Helene Knabe	30 75
" 30.	J. L. Anderson.....	4 21
" 30.	May Stuart	50 00
" 30.	Maude Linn	50 00
" 30.	Florence Froschauer	50 00
" 30.	Alice Christian	50 00
" 30.	Ethel Hoffman	50 00
Oct. 1.	Amer. Toilet Supply Co.....	3 75
" 2.	H. W. Bennett, P. M., stamps, per J. L. Anderson	100 00
" 3.	Dr. Ray Newcomb (services).....	52 15
" 3.	Dr. A. W. Brayton (services).....	29 20
" 3.	Aetna Cabinet Co., book-case.....	35 00
" 27.	Dr. J. N. Hurty.....	95 25
" 27.	J. L. Anderson, express and drayage.....	2 05
" 27.	American Express Co.....	90
" 27.	U. S. Express Co.....	1 89
" 27.	Adams Express Co.....	2 03
" 27.	Western Union Telegraph Co.....	5 64
" 27.	Wm. B. Burford.....	987 25
" 27.	Indianapolis Telephone Co.....	33 90
" 27.	Dr. F. A. Tucker (Board meeting).....	11 45
" 27.	Dr. F. A. Tucker (A. P. H. Ass'n meeting).	84 20
" 27.	Dr. T. Henry Davis (Board meeting).....	14 45
" 27.	Dr. Wm. N. Wishard (Board meeting).....	10 00
" 27.	Dr. N. D. Brayton (services).....	29 50
" 27.	H. W. Bennett, P. M.....	100 00
" 31.	Wm. B. Burford (desk, chair and file cab- inet)	153 00
" 31.	May Stuart	50 00
" 31.	Maude Linn	50 00
" 31.	Alice Christian	50 00
" 31.	Florence Froschauer	50 00
" 31.	Ethel Hoffman	50 00
		<hr/>
		\$2,823 84
Balance reverting to general fund.....		<hr/>
		\$369 90

RECAPITULATION.

Expense fund Nov. 1, 1904, to Oct. 31, 1905.....	\$10,000 00
Expended first quarter.....	\$2,046 30
Expended second quarter.....	1,901 19
Expended third quarter.....	2,858 77
Expended fourth quarter.....	2,823 84
	<hr/>
	9,630 10
Balance reverting to general fund..	\$369 90
Secretary's salary	\$2,400 00
Chief clerk's salary	1,000 00
Appropriation	10,000 00
	<hr/>
Total	\$13,400 00

LABORATORY OF HYGIENE MAINTENANCE FUND STATEMENT.

July 27. Prof. H. E. Barnard, to express and drayage and street and railroad fare.....	\$8 15
June 29. Baker & Adamson Chem. Co., to bill of acids.....	42 37
" 30. H. E. Bishop, assistant chemist, to services two weeks	30 00
" 30. L. W. Bristol, to labor 10½ days.....	15 75
" 30. Frank Kimbal, to labor 6 days.....	9 00
July 7. Henry W. Bennett, P. M., to postage stamps.....	50 00
" 6. Geo. J. Mayer, to rubber stamps.....	65
" 18. Geo. J. Mayer, 2 rubber stamps, 3 line.....	60
" 27. Prof. H. E. Barnard, chemist, to services for July...	125 00
" 31. H. E. Bishop, assistant chemist, to services for July.	60 00
" 31. Nellie M. Coney, to services for July.....	50 00
" 31. Louis W. Bristol, to 6 days' labor.....	9 00
" 31. Freight and drayage.....	1 25
" 20. E. B. Estes & Sons, to 3 cases ¼-oz. S. T. boxes.....	58 73
Aug. 8. New Haven Mills Mfg. Co., to 2,292 boxes.....	46 33
July 31. Nellie M. Coney, salary for August.....	50 00
Aug. 31. Ed. W. Doser, to paints, oils and varnish.....	8 95
" 31. Harry E. Bishop, salary for August.....	60 00
" 31. Geo. Mason, to labor.....	9 75
" 31. L. W. Bristol, to labor.....	38 25
" 31. Sanborn-Marsh Electric Co., mdse.....	3 50
" 31. Geo. J. Mayer, to stencil.....	1 00
" 31. Vonnegut Hardware Co., mdse.....	1 95
" 31. Prof. H. E. Barnard, to salary for August.....	125 00
" 14. Wm. B. Burford, to printing, stationery and supplies.	92 97
" 21. George Mason, to labor 2 days.....	3 00
" 31. Parke, Davis & Co., 50 tube culture media.....	2 50
" 31. Adams Express Co., services in August.....	60
" 31. American Express Co., to services in August.....	2 55
" 31. Wm. B. Burford, 100 engraved cards.....	3 00
Sept. 16. Philip Brodus, to labor 2 weeks.....	20 00

Sept. 18.	Louis W. Bristol, to expense per bills.....	\$32 80
" 22.	Hogan Transfer & Storage Co., freight and drayage in August and September.....	10 86
Aug. 14.	Schofield-Pierson Co., to Pharmacopela.....	4 00
" 31.	Prof. H. E. Baruard, expense at Noblesville August 18th and 19th.....	6 44
Sept. 19.	Hibben-Hollweg Co., to mdse.....	3 68
" 22.	Geo. J. Mayer, to 6 badges.....	4 50
" 22.	Central Supply Co., to mdse.....	6 24
" 22.	H. E. Barnard, to salary.....	125 00
" 22.	H. E. Barnard, to expense.....	5 15
" 30.	H. E. Bishop, to salary.....	60 00
" 30.	H. E. Bishop, to expense.....	6 25
" 30.	Mrs. Nellie M. Coney, to salary for September.....	50 00
" 30.	Louis W. Bristol, to salary.....	60 00
" 30.	Louis W. Bristol, to expense.....	47 54
" 30.	Philip Brodus, to salary 2 weeks.....	20 00
" 15.	Standard Oil Co., to 5 gal. petroleum and 5-gal. can. .	85
" 30.	Wm. B. Burford, by bill printing, stationery, etc....	366 43
July 10.	Bausch & Lomb Optical Co., to mdse.....	4 25
Sept. 29.	Bausch & Lomb Optical Co., to mdse.....	62 55
" 30.	Bausch & Lomb Optical Co., to mdse.....	16 30
Oct. 10.	Louis W. Bristol, to expense per bill.....	57 96
" 12.	B. W. Cohn, to expense per bill.....	112 90
" 18.	B. W. Cohn, to expense.....	67 07
" 19.	Louis W. Bristol, to expense.....	26 09
" 24.	B. W. Cohn, to expense.....	135 63
" 27.	H. E. Barnard, to expense.....	55 54
" 25.	Dr. Helen Knabe, Oct. 3d to 7th.....	26 10
" 19.	G. E. Stechert & Co., by bill periodicals 1906.....	89 95
" 21.	G. E. Stechert & Co., by bill books.....	99 81
" 24.	Mooney-Mueller Drug Co., by bill drugs.....	65 32
" 26.	Louis W. Bristol, to bill expense.....	35 99
" 27.	H. E. Barnard, to services in May, 1905.....	28 00
Sept. 4.	Joseph Gardner, to 6 tin buckets.....	3 00
" 30.	Central Union Tel. Co., to tolls.....	1 70
Oct. 1.	The Aquos Dist. Water Co., 53 gals. double distilled water.....	4 24
" 1.	The Francis Pharmacy Co., to mdse.....	1 10
" 2.	Ed. W. Doser, to mdse.....	85
" 4.	L. E. Morrison & Co., to traveling bag.....	4 50
" 13.	Saks & Co., to mdse.....	8 25
" 24.	Lilly & Stalnaker, to mdse.....	2 60
" 24.	Vonnegut Hardware Co., to sundry mdse.....	36 20
" 20.	Germania Clinical Laboratory, to bill blood serum media.....	45 00
" 27.	American Express Co., to services September and October.....	9 40
" 27.	Adams Express Co., to services September and Oc- tober.....	14 00

Oct. 27.	United States Express Co., to services September and October	\$11 05
" 26.	Hogan Transfer and Storage Co., to freight and drayage	4 07
" 5.	Baker & Co., Inc., to platinum wire.....	5 10
" 23.	Wm. B. Burford, to printing, binding and stationery.	467 08
" 27.	E. H. Sargent & Co., to mdse.....	51 65
" 25.	Daniel Stewart Co., to bill drugs.....	33 67
" 24.	Whitall-Tatum Co., to bill mdse.....	114 36
" 21.	E. H. Sargent & Co., to bill mdse.....	23 50
" 23.	E. H. Sargent & Co., to bill mdse.....	328 82
" 27.	H. W. Bennett, P. M., to postage stamps.....	200 00
" 31.	Dr. Helene Knabe, asst. bact., to services in October and expenses	60 80
" 31.	Freaney Bros., to bill plumbing and fitting.....	391 79
" 31.	Lilly & Stalnaker, to mdse.....	12 15
" 31.	Commercial Distilling Co., to alcohol.....	23 39
" 31.	Fertig & Kevers, to muslin sign.....	4 50
" 31.	Central Union Tel. Co., to tolls for October.....	45
" 31.	H. E. Barnard, to salary.....	125 00
" 31.	H. E. Barnard, to expense.....	58 60
" 31.	H. E. Bishop, to salary.....	60 00
" 31.	H. E. Bishop, to samples groceries.....	15 70
" 31.	B. W. Cohn, to salary 28 days.....	60 00
" 31.	B. W. Cohn, expense traveling and samples.....	132 41
" 31.	Louis W. Bristol, to salary.....	60 00
" 31.	Louis W. Bristol, to expense traveling and samples..	18 41
" 31.	Mrs. Nellie M. Coney, to salary.....	50 00
" 31.	Philip Brodus, to salary, janitor.....	44 17
" 31.	H. D. Cornelius, to labor graining, staining, glazing, etc.	94 60
		<hr/>
		\$5,204 56
Appropriation maintenance fund		\$10,000 00
Expended		5,204 56
		<hr/>
		\$4,795 44

LABORATORY OF HYGIENE EQUIPMENT FUND STATEMENT.

June 27.	Central Wire & Iron Works, to wire baskets and stands	\$31 20
" 16.	Baker & Co., Inc., to merchandise.....	557 39
July 8.	Baker & Co., Inc., to merchandise.....	8 96
" 5.	Smith Premier Typewriter Co., typewriter, desk and chair	123 50
" 20.	Pioneer Brass Works, to 50 brass packing boxes....	6 00
June 13.	Ernest Leitz, to 1 doz. asbestos boards, 40x40x $\frac{1}{2}$	22 59
July 14.	The Emil Greiner Co., to 10 doz. Nessler tubes.....	35 00

July 15.	The Wagner Glass Works, to bill chemical glass and outfits	\$57 87
" 26.	The Vonnegut Hardware Co., bill tools.....	9 50
" 24.	Joseph Gardner, to one oven.....	42 00
" 19.	E. H. Sargent & Co., bill glassware.....	364 79
Aug. 15.	Ballweg & Co., by 50 water bottle carrier boxes.....	30 00
" 15.	Wm. B. Burford, to office desk, chair and steel die of seal	63 25
" 16.	E. H. Eldridge Lumber Co., by counter, tables and wall cases	510 00
" 8.	American Name Plate Co., to centrifugal milk testing machine	76 00
Sept. 22.	E. H. Sargent & Co., to bill mdse.....	775 37
" 22.	Wm. Langsenkamp, to bill mdse.....	97 50
" 22.	Efroymsen & Wolf, to bill mdse.....	4 65
" 13.	Sander & Recker Furniture Co., to office desk.....	60 00
" 13.	Sander & Recker Furniture Co., to office chair.....	12 00
" 27.	Eimer & Amend, to bill mdse.....	512 56
" 30.	H. D. Cornelius, by work and material laboratory of hygiene	91 00
Oct. 5.	H. D. Cornelius, to material painting and plastering laboratory	92 22
Sept. 11.	E. H. Eldridge Lumber Co., to bill mdse.....	24 00
Oct. 7.	Eureka Refrigerator Co., to 1 Opal refrigerator.....	175 00
" 21.	The Emil Greiner Co., to bill glass tubes.....	58 34
" 12.	Bausch & Lomb Optical Co., to bill mdse.....	315 00
" 21.	Bausch & Lomb Optical Co., to bill mdse.....	174 35
" 31.	Central Supply Co., to pipe and fixtures laboratory..	60 16
		<hr/>
		\$4,390 20

REPORT ON STATE MEDICINE AND HYGIENE FOR 1905.

STATE MEDICINE.

LAWS AND AMENDMENTS OF LAWS PERTAINING TO STATE MEDICINE,
PASSED BY THE SIXTY-FOURTH INDIANA GENERAL ASSEMBLY.

Medical.—

“An Act in regard to the State Board of Medical Registration and Examination and concerning eligibility to examination before such board.”

This act was a compromise between scientific medicine and osteopathy. The osteopaths presented a bill creating a special board for the examining, registering and licensing of members of their school. The existing State Board of Registration and Examination and the regular profession opposed the bill and finally a compromise was made, a law with the above title being passed. This law adds one more member to the existing board, making six members in all, and provides, “That any osteopathist now practicing in and a resident of the State of Indiana, and holding a diploma from a reputable college of osteopathy, as determined by the State Board of Medical Registration and Examination, shall be eligible to an examination on proper application to the said board, and should he pass an examination, that he shall be granted a certificate for a license forthwith to practice osteopathy in Indiana.”

Court Decisions Concerning the Medical Law.—There have been no lower and no supreme court decisions which in any way detract from the original form of the law. A score or more prosecutions brought for illegal practice have all been won. It remains true, however, that the traveling advertising quack who has a license, can pursue his infamous work.

Dental.—No amendments to the existing dental law and no new statutes governing dentistry were passed.

Dental Court Decisions.—Two decisions were rendered during the year, both pertaining to the illegal practice of dentistry. No case occurred pertaining to the construction or constitutionality of the law.

Pharmaceutical.—No amendments to the existing law and no new statutes.

Pharmaceutical Court Decisions.—None of importance. Only one or two prosecutions on account of illegal practice.

Hygiene.—Two statutes directly concerning hygiene and sixteen indirectly connected therewith were passed.

First: **State Laboratory of Hygiene.**—This law creates a "State Laboratory of Hygiene" as a department of the State Board of Health and under the general control of said board. The laboratory shall be at Indianapolis, shall have a superintendent "learned and skilled in bacteriology and pathology" and "a skilled chemist." It "shall be used for making analysis of foods and drugs for the purpose of enforcing the pure food and drug laws, for making sanitary analyses, pathological examinations and studies in hygiene and preventive medicine to aid in the enforcement of the health laws, and for no other purpose." All work shall be—"exclusively and entirely for the public benefit, and no fees shall be charged." This laboratory, an absolute essential for a modern State Board of Health, was secured only after six efforts before the legislature. Since the going into effect of the law, April 16, 1905, the State Board has energetically proceeded to open and to start in active work this new department, and it is hoped it will be open for public services by early fall.

Second: **A State Tuberculosis Commission.**—This commission was created by a joint resolution introduced into the Senate. It gives power to appoint five commissioners, two from the Senate, two from the House of Representatives and the fifth a practicing physician. The said commission is to "investigate the need of a hospital for the treatment of tuberculosis in this State and the work of such institutions in other States." The members of the commission are—Dr. Loren Gage, Grandview, Chairman; Dr. Theo. Potter, Indianapolis, Secretary, and R. N. Elliott, Connersville; A. G. Cavins, Terre Haute; Carl E. Wood, Seymour.

Third: **Laws Indirectly Relating to Hygiene.**—(1) Prescribing requirements for nurses, (2) Authorizing the establishment of

county hospitals, (3) Creating an epileptic village, (4) Creating a county drainage commissioner, (5) Concerning public parks, (6) Control of lawn and shade trees, (7) Disposal of garbage by removal or cremation in cities of the fifth class, (8) City departments of health and charities, (9) Concerning sprinkling and sweeping of streets in cities, (10) Establishing sewers and drains in cities, (11) Saturday half holidays in cities of 35,000 or more, (12) Examination of embalmers, (13) Controlling the sale of cigarettes on account of havoc to morals and health, (14) Creating a coal mine inspector, (15) Protection of forests, (16) Marriage law forbidding marriage of those afflicted with a transmissible disease.

The marriage law demands special attention. It is a marked deviation from the ordinary, inasmuch as it forbids the marriage of epileptics, insane, paupers, and those afflicted with a transmissible disease. It further makes it the duty of the State Board of Health to furnish forms of application to marry to the county clerks and gives power to the Board to revise the forms from time to time as may be advisable. It may be that this law affords an opportunity for the State Board of Health to do something toward restoring the evils which come to females through the transmission of venereal diseases by infected husbands.

Failed.—The bill for a new health law failed. This bill provided for the accurate collection, tabulation, analysis and publication of deaths, births and contagious diseases, extended the terms of the health officers to four years, provided adequate compensation, and gave police powers for the better enforcement of the health laws. This bill passed the Senate and also passed to third reading in the House. There it met with the violent opposition of the Speaker who held it up, thus bringing its defeat. It is a matter of regret that the economic and humane work to be done through this bill has been defeated.

EPIDEMICS IN INDIANA IN 1904.

Smallpox was epidemic in one hundred and sixty-seven localities. In that year in the whole state 6,185 cases were reported, with 97 deaths. It is certain that not over 70 per cent. of all smallpox cases were reported. At this estimate there were 8,040 cases in all during the year. The anomaly still exists of physicians who can not diagnose aberrant smallpox. In numerous instances it is not even suspected when unquestionably present and in other instances it has all manner of names given to it. The very fatal form known as black smallpox has appeared in three localities, the last time at Indianapolis, being in a woman whose daughter died in St. Louis of the malady.

Diphtheria was epidemic in only seven places. The deaths numbered 284, and there were 2,766 cases reported, against 423 deaths and 3,968 cases in 1903. A marked decrease.

Scarlet Fever was epidemic in 26 localities. There were 192 deaths and 3,003 cases, against 164 deaths and 2,907 cases in 1903. The disease was very mild in most instances. That scores of cases occurred without recognition is a conclusion forced upon us by many reports and investigation.

Typhoid Fever was epidemic in 76 localities. It prevailed unusually in Indianapolis in September and October. The total deaths numbered 1,013 and the cases reported 8,087. It may be pertinent to remark that not a little of the typhoid fever which oppresses Indiana is directly attributable to so-called "economy." Even in the presence of death and numerous cases, officials when exhorted to do those things necessary to control and prevent typhoid, hesitate or refuse because of the cost. It thus appears that money, or perhaps, political buncomb, is regarded of higher importance than health and happiness. It is a pleasure to note that typhoid is decreasing, as appears from the following table:

Population, Estimated According to U. S. Census Increase from 1890 to 1900.	Total Number of Deaths.	Annual Death Rate Per 1,000 Population.	Typhoid Fever Deaths for Each Year.	Annual Death Rate Per 100,000 Population.
1900.....	2,516,462	35,516	1,440	57.2
1901.....	2,548,476	36,344	1,198	47.0
1902.....	2,581,222	34,069	1,217	47.1
1903.....	2,613,622	33,892	1,013	38.7
1904.....	2,646,022	37,240	1,013	38.2

Diarrheal Diseases continue their deadly work. There were 1,629 deaths under 5 years of age in 1904 against 1,449 in 1903; the rates being respectively 61.3 and 57.5 per 100,000 of people. As want of proper care and improper feeding are the principal inducing causes of diarrheal affections, it plainly appears that physicians have much to do in the line of instructions in these lines. The State Board of Health distributed 10,000 circulars dealing with the prevention of diarrheal diseases in 1904, and the same number will be distributed in 1905.

Pneumonia increased in 1904, as the following table shows:

AVERAGE NUMBER OF DEATHS FOR 5 YEARS, 1900-1904.

Jan.	Feb.	Mch.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
471	526	555	414	236	96	60	61	75	114	183	303

NUMBER DEATHS IN 1904.

Jan.	Feb.	Mch.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
529	680	714	534	305	99	72	50	70	116	223	330

The deaths in 1904 numbered 3,723 and 2,560 in 1903. This is an increase of 6.3 per cent. In Chicago and New York the increase in pneumonia has brought out much comment from the lay as well as the medical press, and in both cities the cases are now required to be reported and preventive instructions are published. It is surely high time that this society took some action.

Tuberculosis seems to be increasing in Indiana, as appears by the following table:

Population, Estimated According to U. S. Census Increase from 1890 to 1900.	Total Number of Deaths.	Annual Death Rate Per 1,000 Population.	Consumption Deaths for Each Year.	Annual Death Rate Per 100,000 Population.
1900..... 2,516,462	35,516	14.1	4,645	184.5
1901..... 2,548,476	36,544	14.3	4,662	182.9
1902..... 2,581,222	34,069	13.1	4,397	174.2
1903..... 2,613,622	33,892	12.9	4,414	166.8
1904..... 2,646,022	37,240	14.0	4,978	188.1

The average rate for the last five years was 159.7 and for 1904 the rate is 188.1, which is an increase in rate of 17.7 per cent. in 1904 over the average for the last five years. The people are certainly awakening to the importance of fighting tuberculosis. This is shown by the interest taken in the matter by the newspapers and by the numerous letters received from citizens at the State Board.

At the first annual meeting of the National Association for the Study and Prevention of Tuberculosis, held at Washington, D. C., May 18-19, 1905, many features of the tuberculosis prevention and cure problem were considered, but chief among them was the question of climate. The conclusions were:

First.—Climate is not essential nor even the most important factor in its treatment.

Second.—Fresh air, rest and nourishing food in abundance are necessary, and the patient must be regular in all of his habits with regard to them.

ANNUAL STATISTICAL REPORT
FOR THE YEAR 1905.

REGISTRATION REPORT, 1905.

This report is for the calendar year 1905. The population figures are estimated from the census of 1900 according to the method of the United States Census Bureau.

Table 1 is a classification of all deaths with rates per 100,000, classified and arranged according to the International system.

Table 2 gives the classification of deaths from all causes by months, ages, color, nationality, and conjugal condition.

Table 2A is a recapitulation of the classified deaths by months, ages, color, nationality and conjugal conditions.

Table 3 gives deaths from all causes by counties, months, ages, color, nationality and conjugal condition.

Table 4 gives the deaths from certain diseases by geographical sections and by counties.

Table 5 gives death rates from certain important causes, by counties and by geographical sections.

Table 6, annual death rates for six years, 1900 to 1906, with averages of cities of 10,000 population and over, compared with rural and State rates.

Table A gives births by counties, months, color and nationality of parents.

Table B gives births by counties, number of children born to each mother, general ages of parents, stillbirths, plurality and illegitimate births.

Table C gives, by counties, the marriages by months, color and nationality

Table D gives, by counties, the marriages by grouped ages.

VITAL STATISTICS.*

The science of vital statistics comprises the analysis and synthesis of facts concerning the life-history of populations. It points out where and to what extent disease and death are on the increase, and suggests, therefore, the inauguration of combative sanitary effort, the efficiency of which it enables us to measure. It furnishes the basis for the study of all the various social problems which affect increase and diminution in numbers.

It is axiomatic that the facts employed must be numerous and accurately stated and classified, in order that the information supplied therefrom shall be trustworthy and of value. These facts comprise those which are yielded by the census, as numbers, age, sex, color, occupation, and conjugal relations, and those reported to and recorded by local and central authorities concerning infectious diseases, marriages, births, and deaths.

The study of these facts and their correct interpretation are by no means simple. In census years, it is not difficult to obtain practically accurate information of the size of the population and the ratios of births, marriages, and deaths, and at all times to know the degree of prevalence of notifiable diseases; but the intelligent interpretation of these facts is often, if not usually, a most complex problem. In the hands of those who understand the fallacies, the numerous sources of error, the corrections to be applied, and the comparative values, statistics can be made to yield knowledge of immense value to sanitary science; but in the hands of the unskilled or unscrupulous, they may be more productive of harm than absolute ignorance, for it is better not to know at all than to be misinformed.

It is well known that it is often possible apparently to prove two direct opposites with the same statistics, the fallacies being unobserved, and to this fact is due the low estimate in which all statistical studies are held by those incapable of distinguishing the false from the true. Statistics may be made to lie while they appear to tell the truth, and they have been raised to superlative rank, therefore, among falsifiers of all degrees.

*Quoted entire from Harrington's Hygiene, for the purpose of instructing Indiana's health officers in this important matter.

As has been said already, the interpretation of statistics is no simple matter. It requires, in fact, a mind not only naturally logical, but trained in drawing scientific inferences, in the recognition and avoidance of the influence of fallacy, and in the correct estimation of the value of different factors and disturbing influences. But even with several such minds working on the same mass of material, decided differences may be found in their respective conclusions, some apparently small fact being overlooked by one or being credited with undue importance by another. Therefore, in publishing facts and inferences, it is well to give as much as possible of the details and to bring out clearly the thread of the reasoning leading to the final conclusions, for then, other analysts may, by pointing out debatable issues, assist in deducing the absolute truth.

The Census.—The very foundation of vital statistics is a knowledge of the size of the population and of the ages of the units of which it is composed. In census years this may be regarded as substantially accurate, but in the intervening years it is necessary to make estimates based on past and present indications, which may lead to wide variations from the truth, not susceptible of correction until the next enumeration. The census is taken in all civilized countries at stated intervals, usually of five or ten years. In France and in Germany, it is taken every five years; in this country and in Great Britain, every ten years. In this country, many of the individual States have an independent enumeration in the middle of the intercensal period, so that the census is virtually quinquennial. The census gives the population of each community and important facts as to age distribution, sex distribution, race, occupations, and civil state.

From the very nature of the work, dealing in a very short time with vast numbers of individual sources of information, no census can be absolutely accurate, but under present methods the results obtained may be regarded as being as nearly accurate as possible. It is probable that in a large degree the errors counterbalance one another, but how far, can be only a matter of conjecture.

The sources of error in census taking are intentional frauds and negligence on the part of the enumerators, ignorance and wilful misstatement on the part of those interrogated, absence of resi-

dents when called upon, and inclusion of transient visitors. In 1890, it is well known, in certain cities gross frauds were practiced in "padding" the returns so as to increase the fees due the individual enumerators concerned. In one case, a hotel register, running back seven years, is known to have served as an aid in the manufacture of population returned. During the same census, many complaints were made that whole streets and districts were omitted altogether, the inference being that the enumerators either did not regard the work as sufficiently remunerative, or made up their reports regardless of the facts and without the disagreeable necessity of going from house to house for information only slowly obtained.

Ignorance on the part of the person questioned is doubtless a more fruitful source of error than intentional misstatement. Many persons do not know their age and give, therefore, only a guess, which is most commonly expressed in multiples of five and ten, more especially the latter. Again, any data concerning the occupants of a house are given by persons not qualified to know; thus, the returns for a whole family may be based upon the statement of a servant not long in the place.

Intentional misstatement is most common with regard to age and occupation, many wishing to appear younger, others older than they really are, and many being reluctant to state correctly the occupations of themselves and of members of their households, preferring, perhaps, to record others more "genteel" or important. Other wilful misstatements are very commonly due to that over-development of the sense of humor that disposes its unfortunate possessor to regard extravagant lying as the acme of wit.

The intentional misstatement of age is more commonly a fault of women than of men. Women are prone to understate their age after passing twenty-five; with men, the tendency is to add rather than subtract. After twenty-five, many women become sensitive and give their ages as under that age, and do not progress for several years. This is shown statistically by the British census returns, from which it appears that the girls of 10 to 15 years of one census, who become women of 20 to 25 years of the next census, reach these latter age periods without suffering any loss in number through death and emigration, but, on the contrary, with

an augmentation, while the women of 20 to 25 years, who become 30 to 35 years old at the next census, show a very great diminution in number.

Thus, as shown by Dr. Farr, the Registrar-General, in 1841, the number of girls of 10 to 15 years was 1,003,119, and in 1851, the number of women of 20 to 25 years was 1,030,456, or 27,337 more, while the women of 20 to 25 years in 1841 numbered 973,696 and yielded in 1851 only 768,711—a loss of 204,985. It is inconceivable that the losses among the younger group, due to death and emigration, should have been more than offset by immigration to the extent of 27,337, and that the same influence should have failed to the extent of 204,985 to do the same thing for those of the later age periods. This discrepancy is said to be capable of demonstration by comparison of the returns of any two consecutive subsequent enumerations. Children's ages are very commonly overstated in the earliest years; then, as the limit of age for free transportation in public conveyances is passed, they are understated as long as possible. Finally, when the statutory minimum of age is the only bar to the utilization of children in the various trades, the years held back are restored with some additions.

Estimated Population.—In intercensal years, it is necessary to estimate as nearly as possible the growth or decline of a population, making use of such factors as can be obtained by comparison of the two preceeding enumerations and from other observed influences. This is very commonly done by dividing the difference between the figures of the two by the number of years of the interval, thus obtaining the yearly increase or diminution, and reducing it to a percentage which is assumed to be the rule obtaining until the next census. This, of course, is merely a guess which may be near or very wide of the truth, since very many influences may be in operation to bring about conditions actually very different. But one must work with the best data available and eliminate as much of error as possible, hence the ratio of increase or diminution is assumed to hold until the next census, and in the meantime errors must be diminished as much as possible.

One of the first errors into which one falls is in assuming a fixed ratio, based up the above-mentioned method of calculation.

Let it be assumed, for example, that the annual increase in the population of a city of 100,000 inhabitants, determined by a comparison of the two preceding enumerations, is 2 per cent.; if we reckon that in 5 'years' time the population will have increased 5 times 2 per cent., that is to say, from 100,000 to 110,000, we fall at once into error, for the increase proceeds not by simple but by compound interest, since in reckoning by simple interest no allowance is made for the augmentation of capital, so to speak, due to the annual increase in the number of persons arriving at the nubile period.

The method generally adopted is, therefore, based on the assumption that population increases in geometrical rather than arithmetical progression, and the formula employed is $P' = P(1 + r)^n$ in which P' represents the estimated population, P the population according to the last census, r the annual rate of increase per unit of population, ascertained by comparison of two successive enumerations, and n the number of the intercensal year in question. On the basis of a 2-per-cent. annual increase, the population at the end of the first year would be 102,000; at the end of the second, it would be 102,000 plus 2 per cent., or 104,040; at the end of the third, 106,121; at the end of the fourth, 108,243; and at the end of the fifth, 110,408, or an increase of 408 over the original estimate.

As an illustration of the manner of applying this formula in the estimation of the population at the expiration of the fifth intercensal year, in this instance of an original population of 100,000 increasing at the rate of 2 per cent., the following may serve. The formula is $P' = 100,000 \times (1 + .02)^5$; $(1 + .02)^5 = 1.10408$. $100,000 \times 1.10408 = 110,408 = P'$ as given above. Much time is saved in the calculation by recourse to logarithms. For a proper estimation of the population at any particular period in the year on this basis, due allowance must be made for the fraction of the uncompleted year.

Population is sometimes estimated by using as a factor the average number of persons per habitation according to the preceding census returns, and multiplying this by the number of houses found to be occupied at the time. Sometimes, also, the number of registered voters is used as a basis of calculation, and again the birth rate, and again the number of children in attendance at the

several schools. These methods, however, are very faulty and often even quite valueless.

Whatever the method adopted and notwithstanding the calculations of the amount of influence exerted by emigration, immigration, unusual prevalence of or freedom from infective diseases and other factors, estimation of population is very frequently wide of the truth. Within recent years, for example, the most careful estimate of the population of London by the Registrar-General was found by the census returns to be no less than a quarter of a million in excess of the truth. With errors in estimation come necessarily errors in all the ratios of births, marriages, and deaths, and these must, therefore, undergo correction at the proper time.

Increase of Population.—The growth in population due to excess of births over deaths is known as the *natural increase*. That which is due to excess of births plus immigration over deaths plus emigration, is known as the *actual increase*. Fluctuations in natural increase are caused by changes in mortality and birth rates; thus, a decline may be due to a diminution in the number of births, or to an increase in the number of deaths, or, more markedly, to both. Fluctuations in actual increase are caused by the same influences plus those of immigration and emigration. Growth may, therefore, be slow or fast, and steady or varied and spasmodic, according to ever possible changing conditions, governed largely by commercial prosperity or depression. Decline in population may be due to excess of deaths over births, but is commonly the consequence of emigration.

Population Constitution.—What is known as the constitution of a population shows the relative proportions of males and females and of persons of different age periods. These facts are obtained only from the census returns, and are commonly accepted as holding good until the next census gives different figures. In cities and large towns, the proportion of females is generally considerably higher than that of males, while in country districts the reverse is true or the excess is slight. This is explained in several ways: In the first place, women are, in general, longer lived than men; in the second, men are more prone than women to return, when advanced in years, to country districts from which they originally sprang: and again, men wear out under the con-

ditions obtaining in crowded communities more rapidly than women. In the population at large, males are more numerous than females.

Age distribution has a very important bearing on the death rate, since, as is well known, the highest death rates, so far as age is concerned, occur always in the earlier age periods. Therefore, the preponderance of individuals of one and another age period has a very great influence in demonstrating apparent differences in salubrity of different localities, when the actual sanitary conditions are identical. With such agreement in sanitary conditions, a community which includes a much larger proportion of young children will show a larger death rate and a smaller marriage rate than another in which the population is more largely made up of young adults. In consequence, it is necessary, in instituting comparisons between two localities, to take into account (and make corrections therefor) the differences in age distribution, and to reduce the respective populations to a common standard.

Registrars' Returns.—Returns concerning births, marriages, deaths and causes thereof, and cases of infective diseases are made to local authorities, such as boards of health, and city or town clerks or registrars. In conjunction with census returns or estimates of population, they reveal the sanitary and sociological conditions obtaining from week to week, month to month, and year to year, in any community in which they are made. Through them we are enabled to watch the death rate from all causes and from any one cause, the amount of preventable disease, the probable fluctuations in populations, and other facts of interest concerning communities and groups thereof. They convey information as to sanitary conditions and suggest wherein improvement in various directions is possible.

The individual facts must, of course, be accurately observed and stated. This is particularly true of causes of death and distribution of infective diseases. The importance of proper groupings is well shown by the worthlessness of the lax returns not infrequently observed. For example, it is not unusual, especially in the older tables, to find "dropsy" standing side by side with "heart disease," "kidney disease," Bright's disease, and other general or vague terms.

The value of the aggregate facts depends very largely upon the length of time during which they have been gathered, since only with the lapse of time can comparisons be instituted and the influence of temporary conditions eliminated or minimized. They must be sufficiently numerous to yield correct averages, for the larger the number of facts, the smaller the fluctuations caused by individual units, and conversely, the smaller the number, the greater the influence of single units, and the greater the chance of error; or, more definitely stated, accuracy increases as the square root of the number of units. Thus, 400 units will yield but half the error of 100, and 900 will yield but a third. In no way, perhaps, can the great influence of individual components of a small aggregate and the small influence of the unit when the aggregate progressively increases be better illustrated than by the daily fluctuations in the comparative standing of a number of athletic organizations, such as ball clubs and bowling clubs, in competition among themselves for a prize or championship. In the beginning single events may cause entire rearrangement, and the fluctuations are wide and the curves most irregular; then, as the number of events increases, the fluctuations are less abrupt and the changes in the curves are gradual.

In order that statistics may be useful, they must admit of comparison with similar figures obtained in other years and also at other places. But correct deductions can be drawn only when the conditions are at least apparently the same or when there is but one essential difference. One may not, for example, compare the death rate of New York for the winter of 1898 with that of Detroit for the summer of 1875, and expect to obtain thereby any information of value. In order to measure the full influence of any one important condition, the other conditions must be in agreement or it must be possible to make correct allowance for any degree of divergence.

Again, one must not ignore the effect of temporary local conditions, such, for example, as an accident in a small community whereby a number of persons are killed at once and others die later from the effects of their injuries. The death rate of that town for that year would be abnormally high, and the sanitary condition of the place might be made by figures to appear much in-

ferior to that of an adjoining one where sickness and death from preventable diseases are much higher all the time.

Marriage Rates.—Statistics as to marriage vary considerably from year to year, according to various circumstances and especially with changing conditions in the prosperity of the general population. The rate is commonly greater in cities and towns than in country districts, not that country-bred people are less inclined to marry, but because large numbers of them are attracted to populous centers after arriving at the wage-earning age, and there they marry.

The marriage rate is usually expressed as so many per 1,000 of population, but this is commonly open to objection, in that it may convey false impressions concerning inclination or disinclination to assume the new responsibilities, and also concerning the communal prosperity. Here, the importance of the population constitution as to age periods and sex is very clear, for in a community made up largely of old persons, young children, and domestic servants from without, the number of marriages occurring among the marriageable element might be very considerable and yet the rate per 1,000 of population would be low. Therefore, a more instructive method of expression would be a statement of the rate obtaining among those of marriageable age. Again, the number per 1,000 of population does not admit of proper comparison of different communities in this particular, unless their population constitution is substantially the same.

Fluctuations in marriage rates are due to other causes than commercial prosperity and depression. It has been observed, for example, that a condition of war diminishes the rate by withdrawing from the marriageable ranks of wage-earners large numbers of able-bodied active men. With return of peace and its attendant release of the troops to civil life, the rate is augmented. Thus, during 1870, when France and Germany were at war, the marriage rates sank respectively to 12.1 and 14.8; two years later (1872) they advanced to 19.5 and 20.7. Age constitution, too, has necessarily an important influence in causing fluctuations. Thus, in a community largely made up of youths and maidens, the time comes when an unusual amount of marriageable material becomes available, and the rate at once advances.

A period of unusual increase in the rate, from whatever cause, is commonly followed by a corresponding decline, just as business prosperity and depression are marked by regular waves. But the general trend is unmistakably toward a diminution. For nearly 30 years, a very gradual decline has obtained in nearly all highly civilized countries.

That more women marry than men, sounds paradoxical, but is, nevertheless, true; for men are more prone than women to second and third marriages, and statistics show that the tendency of widowers to marry spinsters is much more marked than that of bachelors to marry widows.

The age at which marriage occurs has a very important bearing on the natural increase of population, since whether a woman marries early or late in the child-bearing period, determines, other conditions being the same, the extent of fruitfulness and, more particularly, the interval between successive generations. Statistics indicate that among the native-born of this country, particularly in those parts longest settled, and in Great Britain and other countries in which the highest degree of civilization has been reached, the average age at marriage is steadily increasing. This has been attributed to an intelligent selfishness, tending to defer the assumption of responsibility for the maintenance of others, thus ensuring an unrestricted enjoyment of the fruits of labor; and to the wider opportunities for profitable employment of women, with consequent lessened dependence upon marriage as a means of support.

Birth Rates.—Statistics as to births are expressed in the same manner as those concerning marriage; namely, as so many per 1,000 of population. This ratio is known as the *crude birth rate* and conveys no information concerning the proportion of women of the child-bearing age who have added to the population. Here, again, a more accurate and instructive method of expression might be based upon a comparison of the number of legitimate births with the number of married women below 45 years of age, and of the number of illegitimate births with the number of single women of the same limit of age. Under any system, still-births are not included in either the births or deaths, though they are certified.

Birth rates naturally vary very greatly in different communities, the same as marriage rates, and for the same reasons. Ordinarily, they are higher in cities than in the country, and during and immediately following periods of prosperity than during times of depression. A higher rate is to be expected of a manufacturing and commercial center than of a purely residential town, where a large number of unmarried domestics, employed by the well-to-do and rich, swell the population and lower the rates of both marriages and births in the manner already mentioned. In the latter case, the married inhabitants may be unusually prolific, and the birth rate, expressed per 1,000 of married women below 45, would be very high; yet, the crude birth rate would be low. So, in comparing two communities in respect to births, accuracy demands that they shall be reduced to a common basis.

The higher birth rate in cities and large towns is due to the greater proportion of women of child-bearing age, the higher marriage rate, and the earlier marriage age that there obtain among people of the lower classes.

Since the proportion of deaths in the earliest years of childhood is very high, it follows that a high birth rate is always associated with a high death rate, but at the same time, a high birth rate implies a large proportion of married persons in the full vigor of life at that age period which is associated with a low rate of mortality, and thus the influence on the death rate is more or less corrected. A continued high birth rate necessarily implies a large proportion of growing children who, year by year, swell the ranks of the reproductive.

A low birth rate, by causing a relative increase in the proportion of persons of the age periods of low mortality, may bring about a low death rate, but if it continues long enough to bring the population to a high average age, it will be succeeded by a rapid increase in the death rate due to diseases of advancing years.

The birth rates of many countries, like the marriage rates, have for some years shown a steady decline. This is due somewhat to the increasing average age at marriage, which reduces the period of reproduction, but largely to artificial restrictions and economic considerations. The great decline in the birth rate of France has attracted widespread attention and become the subject of grave

concern to the authorities and other thinking people of that country. A hundred years ago, over a quarter of the population of what are known as the Great Powers was French; to-day, notwithstanding the marked disinclination of that people to emigrate and seek new homes, the proportion has fallen to about one-eighth. In 1891, according to census returns, of every hundred families, 22 had but two children, and 24, but one, apiece. The decline in births is not due to poverty, for it is among the poorest there, as elsewhere, that the largest families are raised. The same influences appear to have been in operation for some years in England and Wales, where, since 1876, when the birth rate was 36.3, it fell progressively in 20 years to 29.7, and showed in the last years of the century a more striking decrease than in any other country of Europe.

In our own country, among the descendants of the original colonists and earlier immigrants, the same decline is most evident. Whereas in colonial times and in the earlier years of national independence, families of a dozen, fifteen, and more were exceedingly common, nowadays, one of six or eight becomes a subject of comment, surprise, and even ridicule. The large families of to-day are mainly those of the more recently arrived immigrants and their first generation. In Massachusetts, the statistics for 1898 show that the greatest proportion of the number of births belongs to the foreign-born, the children of native parentage on both sides representing 32.36, those of mixed parentage, 19.42, and those of foreign-born parentage, 48.22 per cent. of the total births. The crude birth rate was 27.37.

Death Rates.—Death rates are calculated in the same way and expressed in the same terms as birth and marriage rates, that is, by multiplying the number reported by 1,000 and dividing the product by the population, or by dividing the reported number by the number of thousands of population, the result in either case being the rate per 1,000 of population. This is known as the general, gross, or crude death rate, and is affected by so many factors that, without careful study and due allowance for disturbing influences, it may prove to be a very faulty index of the health of the people and of the sanitary condition of the place. When used as a basis for comparison of different places, the death

rates must first be corrected by making careful allowances for differences in age, sex, and race distribution, and for abnormal influences.

Influence of Sex.—Sex exerts a decided influence, since, in general, females live longer than males and their mortality is lower at all age periods, excepting from the tenth to the twentieth year. So, of two places equal in sanitary and all other conditions excepting sex constitution, the one with the greater proportion of females will have the lower death rate. Except in newly-settled places, there is, as a rule, a preponderance of females over males, although everywhere the births of males exceed in number those of females, the preponderance being the result of the higher mortality that obtains among males, except at the age periods above mentioned.

Influence of Age.—The influence of age distribution is far greater than that of sex, since, for example, the mortality per 1,000 of children under 5 years of age is more than ten times that of persons between 5 and 25, and more than six times that of adults between 25 and 45. Thus it may be seen that the greater the proportion of population belonging to the earliest and latest periods of life, the higher will be the death rate. One would expect, for example, a higher mortality in a community made up largely of elderly people or young children than in one unusually rich in young adults, or, to reduce the matter to its simplest terms, in a foundling asylum or retreat for the aged than in a college of young men.

Influence of Race.—To a certain extent, racial peculiarities have an influence on vitality and especially on susceptibility to certain diseases. Thus, the negro is far less prone to some and far more susceptible to other morbid influences than the white. As between different people of the same race, the differences are not so wide. In those parts of the country where the negro population is considerable or preponderant, this influence can never be disregarded, and, indeed, it is commonly the practice to calculate separate rates for the whites and for the blacks. According to Hoffman,¹ the mortality of whites and blacks in ten southern

¹ *Race Traits and Tendencies of the American Negro*. Publications of the American Economic Association, New York, 1896.

cities, including Baltimore, Washington, Richmond, Memphis, Louisville, Atlanta, Savannah, Charleston, Mobile, and New Orleans, during the years 1890-94, was expressed as 20.1 and 32.6 respectively. This divergence, it is pointed out, would be still greater, if correction were made for age distribution.

The excess of negro mortality obtaining at all age periods is especially noticeable in the earlier ones. Thus, in 1890, in Washington and Baltimore, the death rates of negro children under 5 and between 5 and 15 years of age were more than double those of white children of the same age periods; in the age periods from the fifteenth to the forty-fifth year, the rates for both races naturally diminish very much, but the ratio is nearly the same. After the forty-fifth year, the difference begins to be much less, but the excess is always with the negro.

As instances of the differences in white and black death rates, the following are presented:

New Orleans	December, 1899,	White, 23.49;	Colored, 28.59
	January, 1900,	" 28.28;	" 44.80
	March, 1900,	" 22.50;	" 39.60
Baltimore	November, 1899,	" 13.42;	" 22.30
	December, 1899,	" 15.00;	" 29.38
	January, 1900,	" 17.90;	" 30.60
Charleston, 5 wks. ending Jan. 6, 1900,		" 15.70;	" 33.23
4 " " Feb. 3,	"	" 12.60;	" 27.50
2 " " Feb. 24,	"	" 19.81;	" 32.94

The difference between white and black mortality is believed to be due more largely to race degeneration than to sanitary conditions. In the North, the negro shows an excess of deaths over births and holds his own only by influx of recruits from the South.

From what has been said, it must be evident that crude death rates cannot be relied upon as a basis of mortality comparison of two places, unless the respective populations are in substantial agreement in age, race, and sex constitution, nor for comparison of the conditions obtaining at the same place in different years, unless these factors are practically unchanged.

Other Influences.—Crude death rates are influenced by errors in estimated population, by the presence of various kinds of public institutions, such as hospitals, state almshouses, and asylums for foundlings and the aged; by migratory movements; by density of

population, and, as has been stated already, by the birth rate. An important source of error lies in the return of persons afflicted with incurable diseases to their old homes, where they die; their deaths are registered there, instead of at the places where the causes thereof had their origin or where the sanitary conditions were such as to favor susceptibility.

Influence of Density.—Death rates, especially those of the very young, are much higher in crowded localities than where the population has plenty of room, and it is commonly accepted that, other things being equal, increased density means increased mortality. To a certain extent this is undoubtedly true, particularly where increased density means overcrowding, but it is not necessarily true of a large population spread out over a territory capable of accommodating twice as many people very comfortably. Thus, in Massachusetts, for example, where, in 1855, the population averaged 136 to the square mile, the general death rate was about the same as obtained 40 years later, when the average population per square mile had more than doubled, the slight difference being in favor of the later period. During the decennium just prior to the outbreak of the civil war, the average rate was 18.25; during the period 1887-1897, it was about 19.50; and in 1898, it was but 17.55, which was the lowest annual rate for 32 years.

In densely populated *overcrowded* localities, such as the slums of large cities, we find all the conditions which favor a high mortality; namely, poverty, immorality, ignorance, intemperance, unsanitary habitations, high birth rate, carelessness, filth, and improper and insufficient food. In fact, the slums are, in very great measure, the cause of the differences observed in the death rates of small and large communities. In country districts, small towns, large towns, and cities situated within the same district, where climatic and other natural conditions are essentially the same, it is commonly observed that the higher average rates obtain in the larger communities, and the lower in the smaller places where slums are unknown, while the very highest occur in manufacturing centers where the main population consists of mill operatives, who work by day under unsanitary conditions and pass their nights in crowded tenements. So, also, higher rates obtain in old manufacturing places, in which a larger proportion of population of a

weak and degenerated type is to be found, than in others more recently established.

Weekly Death Rates, Etc.—The death rate for any particular week is obtained by multiplying the number of deaths occurring during that period by 52.14 (the number of weeks in 365 days) and dividing the product by the number of thousands of population as estimated for the middle of the year.* The same method of reckoning may be employed for determining the rates for other fractions of a year, and for rates of birth, marriage, zymotic disease, and other matters of statistical interest. These weekly and other periodical rates are highly unreliable data upon which to base comparisons with those of other places and other parts of a year, since seasonal influences and temporary conditions must not be ignored; their principal value is in comparing the rates obtaining at the same place at corresponding periods of different years.

In the same way, the weekly death rate from any given cause, or the weekly number of cases of any particular notifiable disease, such as diphtheria, scarlet fever, or measles, may be determined.

Zymotic Death Rate.—The zymotic death rate is the death rate due to the seven principal so-called zymotic diseases; namely, smallpox, scarlet fever, measles, diphtheria, whooping-cough, typhoid fever, and diarrhoeal diseases. It is expressed in terms per 1,000 of population, like the gross death rate. The rate for any disease can be similarly obtained and expressed.

Infantile Death Rate.—The infantile mortality is not expressed in terms per 1,000 of the whole population, but as the number of deaths of children under one year of age to each 1,000 births registered during the year. It is assumed that the efflux of living children whose births have been registered with the local authorities is counterbalanced by the influx of others whose births are registered elsewhere.

Infantile mortality is always high, owing to a variety of causes, and it is particularly high in slums and in manufacturing towns

* Many statisticians employ the factor 52.17747, the number of weeks in the solar year of 365 days, 5 hours, 48 minutes and 46 seconds. This exaggeration of exactness in small things seems all the more absurd when we consider that the estimation of population at the middle of the year is nothing more than a fairly reasonable guess, which often proves to be wide of the truth.

where women are largely employed in factories and so are unable, even though so inclined, to give that personal attention to their offspring as is bestowed by mothers whose lives are purely domestic. In Massachusetts, for example, the infantile death rate averaged, in the decade 1881-1890, 174.9 in the cities and 129.5 in the country, and the extremes for the cities were 239.7, at Fall River, preëminently a "mill town," with all that the term implies, and 111.9, at Newton, where manufacturing is at a minimum and overcrowding practically unknown. Lowell and Lawrence, also "mill towns," showed respectively 222.5 and 213.9, while Boston, commercial, manufacturing, and residential, showed 188.2.

In the three cities with the highest rates, Fall River, Lowell, and Lawrence, the population is largely French Canadian operatives of cotton and woolen mills, housed in crowded tenements. The so-called "shoe towns," Haverhill, Marlboro, Brockton, and Lynn, have a very different kind of population, much better paid and not inclined to a tenement-house life, and show respectively 157.1, 154.6, 146.9, and 140.7, all of which rates are below that of the State at large, 160.4.* Similarly, in England and Wales, where in 1894 the rate was 137, and in 1896, 147.5, Preston, which can claim one of the blackest records in all respects among mill towns, showed, in the former year, 229, and in the latter, 262, while in London the rate was but 159.

The chief factors in the causation of high infantile mortality are premature births, heredity, intemperance, early marriages, neglect, carelessness, ignorance, improper food, unsanitary surroundings, industrial conditions, illegitimacy, and, perhaps, infant life insurance. The immediate causes are chiefly inanition, diarrhœal diseases, measles, whooping-cough and other infective diseases, and violence. The influence of premature birth, heredity, neglect, carelessness, ignorance, and unsanitary surroundings needs no elucidation. Industrial conditions figure largely in the neglect of infants, since mothers in employment return as soon as possible after confinement to their work and entrust their offspring to the care of older children and others, by whom they are improperly fed and looked after. During pregnancy, also, the

*These figures are taken from a communication by Dr. S. W. Abbott, Secretary of the State Board of Health of Massachusetts, on "Infant Mortality in Massachusetts." *Journal of the Massachusetts Association of Boards of Health*, December, 1898, p. 134.

woman remains at her work up to the last possible moment, so that her absence is limited to that period during which she is absolutely incapacitated.

The age of the parents has much influence on the vitality of infants, those of mothers under 20 dying off appreciably faster than those of others between 20 and 30. Between 30 and 35, the vitality of the offspring is still greater, but after this age period it begins to decline. The first children of very young fathers also are, as a general rule, weaker than those begotten later. To this influence of the parents' age, conjoined with that of ignorance and inexperience, may be attributed the excessive mortality which obtains among the first-born.

Illegitimacy has a very great influence on the chance of survival to even the early period of childhood, for the infant is in an unfavorable position as regards care and home surroundings from the beginning. Abandoned by the mother to the care of whomsoever may be willing to accept the charge, or "farmed out" among persons whose interest in its welfare is wholly financial and subject to immediate decline on the cessation or tardiness of payments, it has even less chance, perhaps, than when kept at home, an unwelcome addition both to the family circle and to the expense account.

Infant insurance is generally believed to be an influence in diminishing the amount of care and solicitude for the health of the very young, and, therefore, has been the subject of considerable legislation, by which the maximum amount of the policy is kept at a low figure, as, for instance, the actual expense of burial. Whether insurance really has more than an insignificant bearing, cannot be determined by any trustworthy statistics.

Beyond doubt, the most fruitful single cause of high infant mortality is improper feeding, due partly to the necessity of supplying an artificial substitute for breast milk and partly to ignorance. The breast-fed infant, carelessly looked after, has a far better chance than the bottle-fed more carefully tended. The former receives its natural food at a uniform temperature and practically sterile; the latter is fed upon another kind of milk, differently constituted and of a different degree of digestibility, which, under the best of circumstances, is comparatively rich in

ordinary bacteria and administered at different temperatures, sometimes very hot, sometimes cold. With lack of care, the danger is increased, for the milk may be stale and dirty and act as the vehicle for the exciting cause of cholera infantum, which is responsible to a greater extent than any other morbid condition for the deaths in mill towns of infants whose mothers are employed in the various industries. Besides dirty and stale cow's milk, a variety of cereal and sugar substitutes are provided, which may or may not be digestible and nutritious.

Ignorance of what is proper for introduction into an infant's stomach is responsible for much infantile mortality, even when breast-feeding is followed. Who has not seen fond, but ignorant, mothers, in public conveyances, keeping their infants quiet with bananas, seed cakes, cookies, and other food materials unsuited to a digestive system which can have difficulty enough with milk alone? It seems unlikely that such practices are restricted to the time spent in travel, when consideration for the comfort of strangers suggests the avoidance of fretting and crying.

Death rates of children under five years of age are expressed in the same terms as infantile mortality, that is to say, as the proportion of deaths per 1,000 children of that age period.

High and Low Death Rates.—In the absence of any unusual general unsanitary condition or of unusual prevalence of epidemic diseases, an abrupt rise in, or a very high, death rate is not infrequently only apparent, being based upon an underestimated population. A very low death rate is always open to suspicion, though sometimes, as in newly settled communities with a very high proportion of young male adults, for a limited term of years, it is perfectly possible and natural. A rate of 15 per 1,000, for example, in large cities, is so low as to suggest that the population has been very much overestimated. Within very recent years, the authorities of a rapidly growing Western city noted with great pride the gigantic strides in the estimated population and were naturally much elated to find that the death rate based thereon entitled the city to a position in the first rank of the cities, large and small, of the whole world. The census of 1900 dispelled the illusion, for the population had been grossly exaggerated and the actual death rate was comparatively high.

Death rates as low as 10 and 12 are sometimes noted. A continued rate of 10 in a stationary population would mean that the inhabitants would average 100 years of age at death; one of 12 would mean an average age of over 83; one of 15 would mean an average of nearly 67.

As examples of high and low death rates, the following for the same quarter of the same year (1897) may be cited:

High.	Low.
Dublin.....39.9	Frankfort a/M.....15.6
Moscow.....36.9	The Hague.....16.2
Bucharest.....33.2	Berlin.....17.0
Belfast.....31.3	Christiania.....17.7
St. Petersburg.....31.0	Amsterdam.....17.8

The influence of improved sanitation in the lowering of the mortality of any given place cannot be disputed, but in attributing the whole or even the greater part of the difference in the rates of any two places or of the same place in different years, one must be careful not to ignore factors, already mentioned, that exert influences beyond the control of sanitary authorities. Permanent decline in mortality rate is a matter of slow growth and is the combined result of sanitary effort and mitigation of the occupational and social conditions tending to lower vitality. In Elizabethan times, the death rate of London was about 40; at the beginning of the reign of Victoria, it was 24, and at the end of the century, about 19.

Correction of Death Rates.—The impossibility of making a fair comparison of the death rates at different places without taking into consideration the constitution of the respective populations as to age, sex, and race, has been already sufficiently pointed out, and since two places absolutely alike with regard to occupational influences, wealth, density of population, climate, soil, water supply, sanitary administration, and general sanitary condition, but discrepant as regards the distribution of the sexes, age periods, and race, may show very different death rates, perhaps magnifying the salubrity of the one and exaggerating the unhealthiness of the other, it becomes necessary to have some method of bringing them to a common basis. In the matter of race influence, the best plan is to separate the statistics absolutely, having one set for the

white and another for the colored population, and compare white with white and negro with negro.

The method commonly recommended for correcting according to sex and age is the one in use in the office of the Registrar-General for England and Wales; this may be briefly described as follows.

The mean annual death rate of the country for each sex at each of the eleven age periods, namely, below 5, 5-10, 10-15, 15-20, 20-25, 25-35, 35-45, 45-55, 55-65, 65-75, and 75 and upwards, during the last preceding 10 years, is obtained and multiplied by the number of those of each sex at each corresponding age period in the territory under consideration, according to the returns of the last preceding census. Each product thus obtained, divided by 1,000, gives the calculated number of deaths for the respective sex and age periods. These 22 results, added together, represent the calculated number of deaths for the place in question in one year. The total calculated number of deaths, divided by the number of thousands of population or multiplied by 1,000 and divided by the population, gives the *standard death rate*.

The next step is to obtain a factor for correction, by determining the ratio which the standard death rate of the place bears to the death rate of the whole country. This is obtained by the rule of simple proportion, the second mean being unity. The recorded death rate for the year, multiplied by this factor, gives the *corrected death rate*, which will, therefore, be above or below the recorded rate, according as the factor is above or below unity. By dividing the corrected death rate by the death rate of the whole country and multiplying the quotient by 1,000, the *comparative mortality figure* is obtained; that is to say, the number of deaths which will occur in the same number of the local population as in the general population, will yield 1,000 deaths.

Classification of Causes of Death.—In the registration of causes of death, a certain amount of error is inevitable, for several reasons. In the first place, even the most competent practitioners are not infallible in diagnosis, and it is not always possible, when one pathological state is complicated by the advent of another, to determine which was the actual cause of the fatal termination. Next, the nomenclature of diseases is faulty, though ever tending

toward ultimate perfection. Again, the true cause of death is frequently intentionally misrepresented for private or family reasons; thus, apoplexy, instead of suicide, and peritonitis, when the actual cause of the peritonitis is criminal interference.

Lastly, it is sometimes the case that no cause whatever is assignable, even after careful autopsy, and, obviously, such cannot be classified. With the existence of an indeterminate amount of error, it follows that caution must be exercised in comparing results representing a series of years, and allowances must be kept in mind with changes in nomenclature, when drawing deductions from what has been described as the classification of the more or less reliable guesses of a large number of more or less skilled observers.

Registration of sickness, if it were possible, would afford a far more efficient index of the sanitary condition of the population than the registration of deaths, which gives us simply the number of cases of sickness which ended fatally, but no idea of the duration thereof or of the number of persons temporarily incapacitated. A disease ordinarily regarded as fairly dangerous may prevail very extensively in a mild form and be attended by a very low death rate, and again may exist to a lesser extent, but in an unusually severe form, with a high proportion of fatalities. Many diseases, again, are temporarily disabling and often widely prevalent, but play a small part in mortality returns. Tonsillitis, for example, is responsible for much discomfort and lost time: its prevalence has some meaning, but its death roll is exceedingly small. Rheumatism is much more widespread than mortality returns would imply; chickenpox is relatively unimportant, but in some places its notification is required as a safeguard against the spread of smallpox incorrectly diagnosed as varicella; gonorrhœa, without being fatal, does more harm than is commonly supposed, and syphilis, also not immediately and directly fatal, sends its victims into the mortality returns through various avenues.

But however desirable such registration may be, the obstacles in the way of its accomplishment are too numerous to admit even of hope, and excepting in the case of infective diseases, which law requires shall be reported, there is no satisfactory method of obtaining an accurate idea of the health of a community.

Duration of Life.—Several expressions and methods are employed to denote and measure the duration of life, a problem with which the science of vital statistics is largely engaged. One of the most fallacious indications of longevity and sanitary condition is the *Mean age at Death* or *Mean Lifetime*, which is the sum of the ages at death divided by the number of deaths. This is unreliable, because it fluctuates very widely, according to age distribution; for in a community containing a large proportion of children and in which the birth rate and, consequently, the infantile mortality are high, the average age at death will be lower than in another, equally healthy, in which these conditions do not obtain. Hence, it can only be employed with any degree of safety where the population constitution is uniform in all respects and when the observations are carried along over a long period. The mean age at death, not of a few hundreds or thousands of individuals, but of an entire generation of population, is necessary to show accurately the mean duration of life, and this is determined only by means of life tables.

Probable duration of life signifies the age at which half of any number of children born will have died, so that they have equal chances of dying before and after that age. It is also called the *vie probable* and the *equation of Life*, but all of these terms are ill-chosen, for every possible duration of life has a certain probability, which may be determined by life tables.

Mean duration of life is another ill-chosen term with which the last-mentioned is often confounded, but which has an entirely different meaning. It is meant to express the probable duration of life from the date of birth. In an ordinary population, subjected to the usual disturbing influences of migration, it means present age plus the probable length of life after passing a given point, and is commonly called the *expectation of life* or *mean after-lifetime*. It is a term which, by reason of its indefiniteness and looseness of application, it would be well to eliminate altogether.

Expectation of life, or mean after-lifetime, is the average number of years which an individual at any given age will continue to live, as shown by a life table. As applied to whole communities, it is the mean duration of life of a generation of individuals from

birth to death and is regarded as the only true measure of the health of entire populations. Like others which have gone before, it is an unfortunate expression tending to confusion. "The term does not imply that an individual may reasonably expect to live a given number of years. The excess of those who die late is distributed among those who die early, 'those who live longer enjoying as much more in proportion to their number as those who fall short enjoy less of life.' Thus the expectation of life has no relation whatever to the most probable lifetime of any given individual." (Newsholme.)

"*Expectation of life* is an incorrect term: the time which it is *expected* a person will live is the time which it is an even chance he will live; it is the *vie probable* of the French, and is correctly expressed by 'probable lifetime.' The after-lifetime can only be the same as the probable lifetime on Demoivre's hypothesis—that the surviving form an arithmetical progression. The term 'expectation of life,' first used by Demoivre, is correct, on that supposition, which is, however, in itself quite erroneous. The idea intended to be expressed by 'expectation of life' is the *mean time* which a number of persons at any instant of age will live after that instant; it is the French *vie moyenne*; and this technical idea is strictly and shortly expressed by *afterlifetime*, a pure English word, formed on the same analogy as *afterlife*, *aftertimes*, *afterage*, *afterhours*. The *afterlifetime* of men at the age of 30 is 33 years by the English Life Table: 33 years is not the precise time probably that anyone of that age will live, but the average time that a number of men of that age will live, taken one with another. $\text{Age} + \text{afterlifetime} = \text{Lifetime}$. At 30 this is $30 + 33 = 63$, the average age which men now aged 30 will attain. At birth this is $0 + 40 = 40$; when *lifetime* and *afterlifetime* are the same thing.

"The *lifetime* simply, without the addition *at a given age*, will serve to express in one word what is improperly called the *expectation of life at birth*; thus the *lifetime* of males in England is 40 years, the *lifetime* of males in *Manchester* is 24 years. Those who, from habit, prefer 'expectation of life,' can always substitute it for *afterlifetime*; from the use of which, in this paper, no ambiguity can arise." (Dr. William Farr, Eighth Annual Report of the Registrar-General, p. 279.)

Life Tables.—A life table, according to Dr. Farr, is an instrument of precision. "It may be called a *biometer*, for it gives the exact measure of the duration of life under given circumstances. * * * A life table represents a generation of men passing through time; and time under this aspect, dating from birth, is called age. In the first column of a life table, *age* is expressed in *years*, commencing at 0 (birth), and proceeding to 100 or 110 years, the extreme limit of observed lifetime."

In order to construct a life table, it is essential to have, as material, a knowledge of the size of the population and its age and sex distribution, and the returns of death for a year, or a series of years, arranged according to age at death and sex; and for tools, certain abstruse mathematical formulæ which it is hardly necessary to consider here. The principle upon which the tables are based is that if a large number of persons, 100,000 for instance, born at the same time, were followed from birth to the grave and their deaths recorded in the usual manner, the average age lived could be obtained by dividing the sum of their ages at death by their original number, and the number of deaths and of survivors at each period would be known. Another lot of the same size, observed elsewhere, and living under different conditions, would give different results, and thus the influence of the discrepant conditions could be measured.

To ensure as great accuracy as possible in constructing life tables, it is best to take the death returns for the entire intercensal period of 5 or 10 years and the mean population, for the experience of a single year may be very exceptional. Tables can be constructed comprising each year of life or according to quinquennial periods, and are made for each sex. From them one determines the probable proportion of a given number that will arrive at different ages, the probability of living a given time at each year or period of age, the mean afterlifetime at the end of any given year or period, and the aggregate future lifetime of the survivors at the end of each year or age period, or what is known as the *life capital* of the entire community.

The probability of living a given time for each year of life or age period equals the number of survivors at the beginning, into the number at the end of the year or period. The probable num-

ber of survivors at each year or period is obtainable directly. The mean afterlifetime at the end of any given year or period is obtained by adding together the years lived by the whole life-table population beyond the year or period, and dividing the sum by the number of survivors at that particular time. The life capital of a community, divided by the population, gives the average future lifetime; and into a hundred times the population, gives the percentage of annual expenditure of life capital, since the mean population equals years of life expended in a year.

For further information concerning this branch of vital statistics, and for further consideration of statistical methods, values and errors, the reader is referred to the many standard works dealing with the subject.

STUDY OF THE VITAL STATISTICS OF 1905.

BIRTHS.

Forty-four thousand one hundred and fourteen births were reported; 22,270 males, 20,869 females. White males, 22,279; white females, 20,869; colored males, 491; colored females, 464. In the preceding year 42,756 births were reported; males, 22,212; females, 20,544. July shows the largest number of births, 4,217, and December the lowest, 3,233. The births (44,114) exceed the deaths (36,502) by 7,612, the death rate being 13.78 per 1,000, and birth rate 16.65. It is very true that all births are not reported, owing to the absence of a penalty in the law which is sufficient. The failure is due, also, in part to the inefficiency of health officers. The real birth rate can not be less than 20, and probably is nearer 25.

The nationality of parents shows as follows: American-born fathers, 39,527; American-born mothers, 40,361. Foreign-born fathers, 2,582; foreign-born mothers, 2,060. Nationality not reported: Fathers, 1,572, and mothers, 1,260.

As to the number of children to each mother, the reports show that 429 mothers have had ten children, 242 have had eleven, and 281 have had twelve and over. As to the ages of parents it appears that 835 fathers were in the age period of 50 to 60, and

that 50 mothers were in the same period; 104 fathers were 60 to 70, and 14 mothers in the same period. There were 14 fathers 70 to 80, but no mothers of this age. The fathers under 20 numbered 630, and the mothers 4,834. The plural births numbered 844, of which 449 were males and 395 females. There were 826 illegitimate births, 395 males and 431 females. The stillbirths, also counted as deaths, numbered 2,236.

MARRIAGES.

The total marriages reported was 25,610. In the preceding year, 25,810. December was the most popular month for marriages, when 2,654 occurred. May, with 1,662, was the least popular. October was the leading month for weddings in 1903 and 1904. The nationality was: American-born grooms, 23,709; American-born brides, 23,963; foreign-born grooms, 1,521; foreign-born brides, 1,245. Nationality not reported, 380 grooms and 402 brides. The white weddings numbered 24,706, and the colored 904. The grooms under 20 numbered 749; brides, 6,174. In the age period, 60 to 70, there were 384 grooms and 149 brides. In the age period of 70 to 80, grooms 125, brides 27. In age period 80 and over, 7 grooms and 3 brides.

DEATHS.

Deaths reported in 1905 numbered 36,502, rate, 13.78. In the preceding year 37,240, rate, 14. Males, 19,064; females, 17,438. Whites, 35,096, rate, 14.2; colored, 1,406, rate, 24.2. The death rates by sex of whites and blacks, are: Whites, males, 14.5; females, 13.9. Colored, males, 25.1; females, 23.3. American born 32,614; foreign born 3,532; nationality not reported 356. Single 16,428; married 12,883; widowed 6,730; conjugal condition not reported 461.

The number of deaths with rates for the years named appear in the following table:

	1900	1901	1902	1903	1904	1905
Deaths	36,516	36,544	34,069	33,892	37,240	36,502
Annual Rate	14.1	14.5	13.5	13.4	14.0	13.78

The age period tables show some interesting facts. Eight thousand two hundred seventy-seven deaths, or 22.6 per cent. of the total, occurred in the first year of life. This is a close approach to one-fourth. Two thousand four hundred twenty-three deaths occurred in the age period 1 to 5. Therefore there was a total loss of babies of 10,700, or 29.3 per cent. of the total deaths. This is 24.2 per cent. of the total births reported. The deaths in the age period 5 to 20 numbered 2,608, or 7.1 per cent. of the total deaths. The total loss in the legal infancy period, under 21, was 13,308 or 36.4 per cent. of the total. This awful loss is principally the result of ignorance. In the age period of extra usefulness, the prime of life, namely, 20 to 50, there were 8,173 deaths, or 22.3 per cent. of the total. It is noted that 385 deaths occurred of persons 90 years old and over.

The following table, giving deaths by months, shows February in the lead, March next and June lowest.

Jan.	Feb.	Mch.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
3,479	3,819	3,629	2,766	2,690	2,546	2,932	3,174	3,091	2,801	2,773	2,802

January, February and March are the highest tuberculosis and pneumonia months, and July and August the months having the highest number of deaths from diarrhea and typhoid. These preventable diseases account for the large number of deaths during the months named.

CAUSES OF DEATH.

It is found difficult to impress upon many physicians the importance of being careful in stating the cause of death. All too frequently the cause assigned is vague and indefinite—as debility, abscess, tumor, hemorrhage, etc. Through numerous letters written to practitioners in regard to vague returns, we discover that much ignorance and stubbornness exist. More than once in reply to our question as to what caused the “debility” or the hemorrhage, the reply has been such as to plainly indicate that the respondent for the first time had his eyes opened to the fact that debility and hemorrhage had a cause back of them.

Marasmus is a favorite term with some doctors as a cause of death, and it is past understanding why so many do not understand that this word unqualified has no definite significance. Convulsions is a term frequently used as a cause of death. When possible, the cause of convulsions should be given. Such terms as kidney disease, liver trouble, lung trouble, bladder trouble, when given without explanations as causes of death, are not creditable to the intelligence of the physicians who use them.

PRINCIPAL CAUSES OF DEATH IN 1905.

The following table gives the principal causes of death in their numerical order and Chart No. 1, following, gives a graphic representation :

1. Pulmonary tuberculosis.....	3,998	22. Simple peritonitis.....	338
2. Pneumonia.....	2,711	23. Cerebro-spinal meningitis.....	460
3. Organic heart disease.....	2,182	24. Convulsions of infants.....	306
4. Diseases of infants.....	1,908	25. Other respiratory diseases.....	285
5. Infantile diarrhoea.....	1,700	26. Diphtheria and croup.....	366
6. Accidents.....	1,628	27. Suicides.....	338
7. Cerebral congestion and hemorrhage.....	1,351	28. Rheumatism.....	253
8. Bright's disease.....	1,423	29. Other genito-urinary diseases.....	194
9. Cancer.....	1,424	30. Diabetes.....	231
10. Typhoid fever.....	928	31. Measles.....	6
11. Paralysis.....	901	32. Acute nephritis.....	169
12. Broncho pneumonia.....	555	33. Scarlet fever.....	133
13. Other circulatory diseases.....	638	34. Dysentery.....	218
14. Liver diseases.....	578	35. Malformations.....	167
15. Bronchitis.....	750	36. Iliac abscesses.....	194
16. Stomach diseases.....	678	37. Skin diseases.....	179
17. Other forms of tuberculosis.....	494	38. Malaria.....	116
18. Simple meningitis.....	352	39. Smallpox.....	35
19. Other digestive diseases.....	498	40. Whooping cough.....	136
20. Influenza.....	591	41. Diseases of female genital organs.....	88
21. Diarrhoea and enteritis.....	424	42. Homicides.....	84

PRINCIPAL CAUSES OF DEATH IN INDIANA 1905

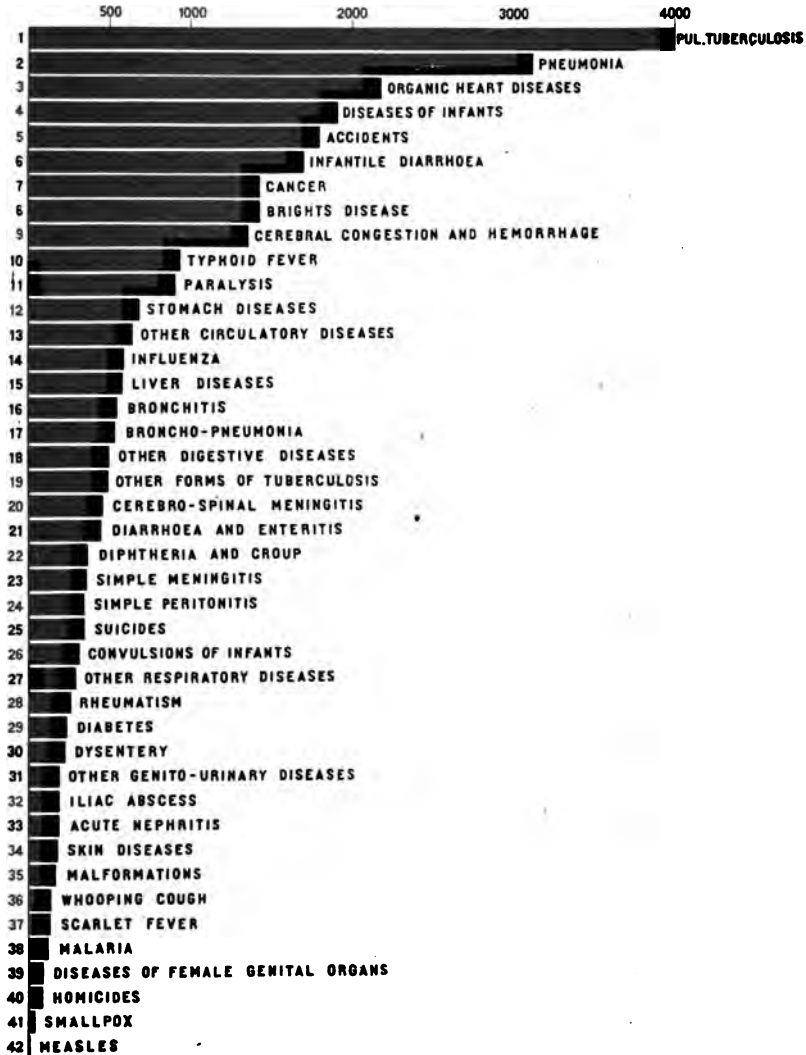


CHART No. 1.

TABLE SHOWING NUMBER OF DEATHS FROM CERTAIN DISEASES, WITH RATES PER 100,000, FOR SIX YEARS.

CAUSES.	1900.		1901.		1902.		1903.		1904.		1905.		Rate.	
	Rate.		Rate.		Rate.		Rate.		Rate.		Rate.		Rate.	
Pulmonary tuberculosis.....	3,364	133.6	4,115	163.5	3,900	154.9	3,864	153.5	4,436	166.9	3,998	150.9		
Typhoid fever.....	1,440	57.2	1,198	47.6	1,217	48.3	1,013	40.2	1,013	39.1	928	30.5		
Diphtheria.....	687	27.2	487	19.3	424	16.7	462	18.3	284	10.6	328	12.3		
Diarrheal diseases.....	2,049	81.4	1,776	70.5	1,779	70.6	1,449	57.5	1,629	61.3	1,700	64.1		
Influenza.....	424	16.8	1,049	41.6	302	12.0	348	13.8	434	16.3	591	22.3		
Puerperal septicemia.....	172	6.8	234	9.2	136	5.4	161	6.3	170	6.3	178	6.7		
Under 1 year of age.....	6,310	250.5	8,015	314.5	7,621	302.8	7,510	288.4	8,040	302.6	8,277	312.5		
One to 5, inclusive.....	3,150	125.1	2,895	115.0	2,631	104.5	2,361	93.8	2,657	100.0	2,423	91.4		
Sixty-five and over.....	8,437	335.2	9,414	374.0	8,567	340.4	8,810	350.0	9,825	14.0	9,838	371.4		
Total deaths.....	35,516	14.1	36,544	14.5	34,069	13.5	33,892	13.4	37,240	14.0	36,502	13.7		

TUBERCULOSIS.

HAYOC WROUGHT BY TUBERCULOSIS IN INDIANA IN 1904-1905.

	1904.	1905.
Total tuberculosis deaths.....	4,978	4,492
Male deaths	1,807	1,745
Female deaths	3,171	2,798
Mothers, age 18 to 40, prime of life	867	987
Fathers, age 18 to 40, prime of life	490	315
Orphans made under 12 years of age.....	2,703	2,694
Homes invaded	1,396	3,307
Annual cost to the people, \$10,000,000.		

An evident decrease in consumption appears in the above comparison. This is also the case in the comparison of 1905 with the averages of the last six years, as appears in charts No. 2 and No. 3. This fact appears again in the comparison of deaths by ages for 1905 with the last six years in Chart No. 4.

CONSUMPTION.

Comparison of 1905 with average of the last six years.

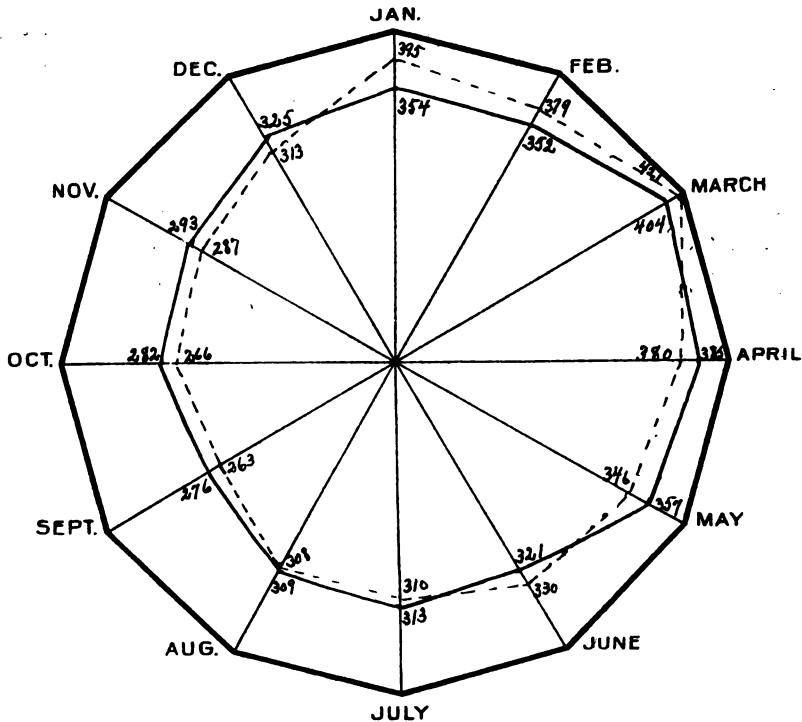


CHART No. 2.

———— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

Four months show more than average.

Eight months show less than average.

By Months.—The tuberculosis deaths show the same regularity as heretofore.

MONTHS.	Average Deaths.	Average State Rate.	Average City Rate.	Average Country Rate.
January	370	145.6	196.8	140.0
February	363	158.5	216.4	164.3
March	411	164.2	214.6	171.0
April	383	151.7	200.7	147.8
May	353	139.2	187.5	137.6
June	324	133.4	171.8	129.1
July	312	122.7	161.7	123.6
August	309	123.3	147.7	121.2
September	271	111.2	138.5	117.2
October	276	109.7	141.9	108.1
November	290	124.3	164.7	122.4
December	320	127.8	177.4	119.0
Total	3,982	150.3	176.6	133.4

March, April and May had the largest number of deaths. March 421, which was 17 more than the average for the last six years; April 380, or 5 less than the average for the same six-year period; and May 346, or 11 less.

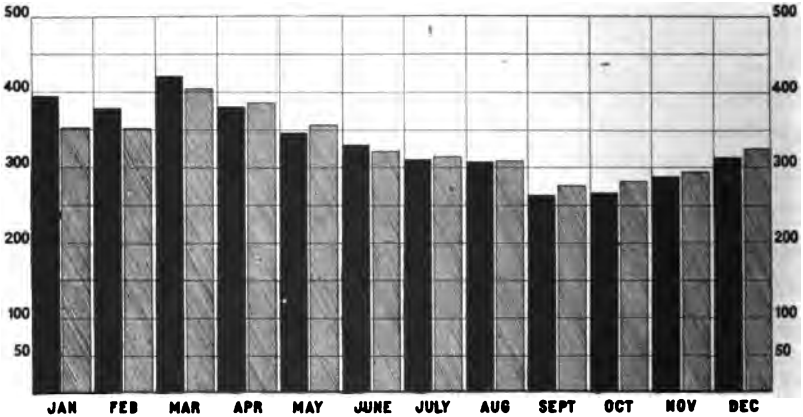
Chart No. 5 is a graphic representation of the deaths by months.

By Age.—As in former years, the age period 20 to 25 shows the greatest number of deaths. The deaths for the first ten years of life are almost negligible, a distinct rise occurring at 10 to 15. In the next period, 15 to 20, the rise is very marked.

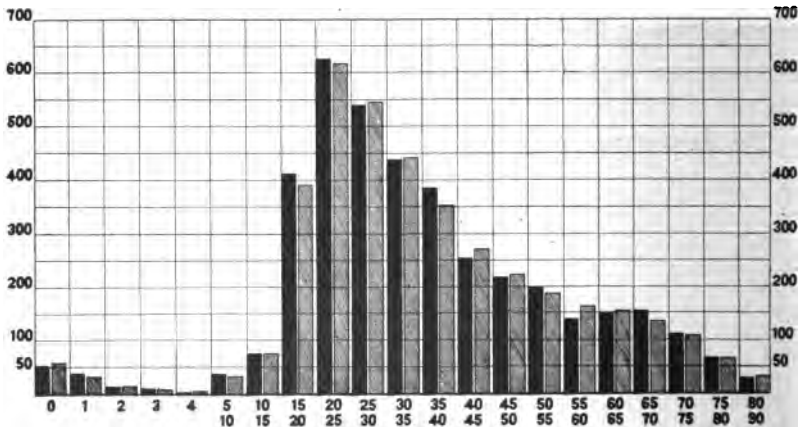
After the 20 to 25 period there is a decline. From 15 to 40, in which period there were — deaths, is the critical time. After the age of 40 there is a distinct subsidence.

The destruction by ages plainly appears in Chart No. 6.

INDIANA
PULMONARY TUBERCULOSIS
COMPARISON BY MONTHS
 ■ - 1905 ▨ - AVERAGE FOR LAST SIX YEARS



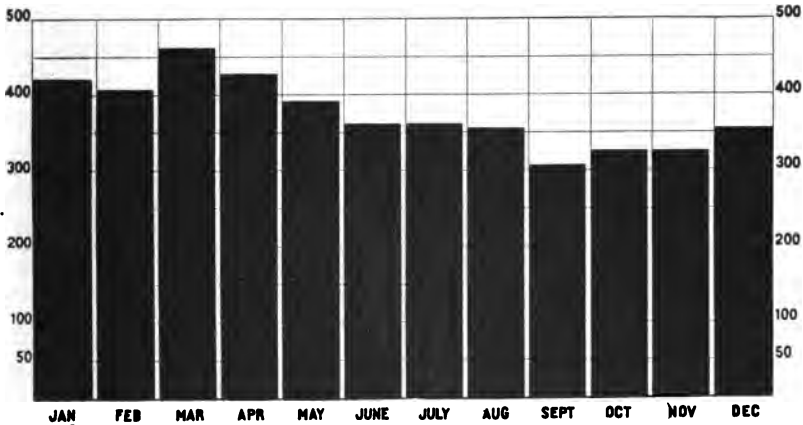
COMPARISON BY AGES



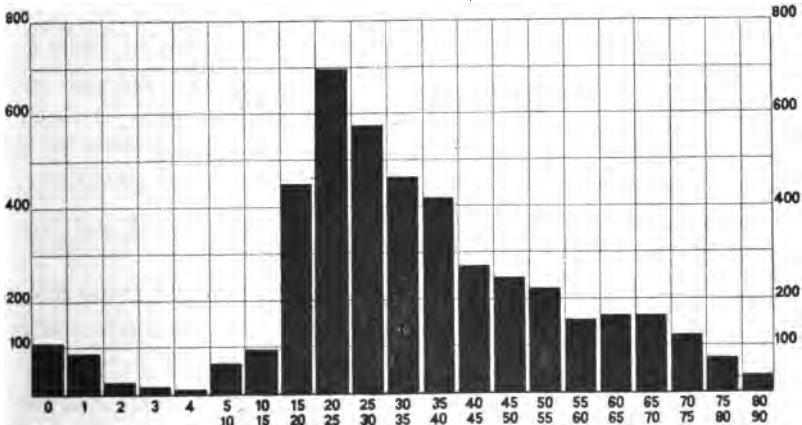
CHARTS Nos. 3 and 4.

TUBERCULOSIS ALL FORMS

BY MONTHS 1905
INDIANA



AGES



CHARTS Nos. 5 and 6.

TUBERCULOSIS IN 1905—RECORD BY MONTHS.

January.—Deaths from tuberculosis numbered 393. Of the 92 counties, all but nine report deaths from this disease. The rate was 175 per 100,000 population. In the same month last year, consumption deaths numbered 398, a rate of 176. By ages, the deaths were: Under 10, 24; 10 to 20, 43; 20 to 30, 102; 30 to 40, 81; 40 to 50, 40; 50 to 60, 44; 60 to 70, 36; 70 to 80, 19; 80 to 90, 4. The female deaths numbered 219 and the male 177. Of the males, 20 were between the ages of 18 and 40, and left 48 orphans under 12. Of the females, 82 were mothers between the ages of 18 and 40, and they left 168 orphans under 12. Consumption therefore in January made 216 orphans under 12, made 20 young widows, and 82 young widowers, and invaded over 300 homes. Is it not strange that we are so impractical as to permit this awful destruction when sanitary science stands ready to prevent it in a large part?

February.—Deaths from tuberculosis numbered 410, 29 of them being other forms than pulmonary. Of the 92 counties, all but four report deaths from the "Great White Plague." The rate for the pulmonary form was 187 per 100,000. In the same month last year there were 365 deaths, a rate of 182.7. By ages, the deaths were: Under 1 year, 12; 1 to 10, 11; 10 to 20, 40; 20 to 30, 122; 30 to 40, 65; 40 to 50, 58; 50 to 60, 38; 60 and over, 64. The male deaths numbered 188, and 26 of these were married and between the ages of 18 and 40 and left 55 orphans under 12 years of age. Two hundred and twenty-two were females, and 76 of them were married and between the ages of 18 and 40 and left 157 orphans under 12 years of age. Three hundred and nine homes were invaded by the disease.

March.—Deaths from tuberculosis numbered 446, 399 being pulmonary and the remainder other forms. Of the total number 173 were males and 273 females. Two hundred and sixty-one, or 58 per cent., were between the ages of 15 and 40. One hundred and four females between the ages of 18 and 40 were married and left 208 orphans. Of the males, 34 were in the same age period as above and left 73 orphans. The homes invaded were 301.

April.—Three hundred and ninety deaths were reported from consumption, 344 being of the pulmonary form and 46 other than

pulmonary. The April rate was 158.4 in each 100,000. In the preceding month the rate was 177.7. In the corresponding month last year it was 176.8. Of the total consumption deaths this month, 176 were males and 114 females; 118 were between the ages of 20 and 30, 88 in the age period of 30 to 40, 54 in the age period of 40 to 50. Of the total deaths, 42 were men in the prime of life, 18 to 40, and were married, with children. They left 84 orphans. Of the total number, 92 were women in the same useful period of life, and they left 196 orphans. Over 300 homes were invaded and 280 orphans under 12 years of age made by the disease. How many of these orphans will find their way into the orphan asylums and how many will, because of lack of parental care, become charges upon the State, can not be told.

May.—Three hundred and seventy-three deaths were reported from tuberculosis, 322 being of the pulmonary form, and 41 other than pulmonary. The rate was 143.4 in 100,000. In the preceding month the rate was 158.4, and in the corresponding month last year the rate was 184.3. Of the total consumption deaths this month, 154 were males and 219 females. By age periods, the consumption deaths were: Fifteen years and under, 34; 15 to 20, 37; 20 to 30, 111; 30 to 40, 72; 40 to 50, 41; over 50, 78. It is remarkable to record that of the consumption deaths, one was a woman 105 years old. Of the total female deaths, 85 were between the ages of 18 and 40, and left 176 children under 12 years of age. Of the male deaths, 20 were in the same age period and left 43 children under 12 years of age. In all, the disease made 219 orphans in the above age period, and it invaded over 300 homes.

June.—There were 354 deaths from tuberculosis, 320 being of the pulmonary form. Of this number, 214 were females and 140 males. Of the females, 79 were married and between the ages of 18 and 40, the prime of life, and they left 168 orphans under 12 years of age. Of the males, 22 were married and in the age period of 18 to 40, and they left 45 orphans under 12 years of age. The disease, therefore, created 213 orphans under 12 years of age, invading almost 200 homes. Two hundred and forty-seven of the consumption deaths were persons between the ages of 15 and 50, which may be termed the working period of

life. This record is not quite as high as in the corresponding month last year, and is also lower than the preceding month.

July.—Tuberculosis deaths numbered 321, 286 being of the pulmonary form. Of this number, 108 were males and 213 females. Of the females, 76 were married and were between the ages of 18 and 40, and they left 152 orphans under 12 years of age. Of the males 23 were married, in the same age period, and they left 51 orphans under 12 years of age. This makes 203 orphans either fatherless or motherless produced by this disease in one month. Two hundred ninety-eight homes were invaded. Of the total number of persons dead from consumption, 212 were between the ages of 15 and 50, the prime of life. Three of the consumption deaths were of people over 80 years of age.

August.—Tuberculosis deaths numbered 340, 292 being pulmonary and 48 other forms. Of this number 210 were females and 129 males. Of the females, 75 were married and were between the ages of 18 and 40 and they left 156 orphans under 12 years of age. Of the males, 26 were married and in the same age period as above, and they left 52 orphans under 12 years of age. This makes 209 orphans, either fatherless or motherless, produced by this disease in one month. Three hundred and one homes were invaded. Of the total number of persons dead from consumption, 253 were between the ages of 15 and 50, the prime of life. Three consumption deaths were people over 80 years of age. Three hundred and sixty-four tuberculosis deaths were reported in the corresponding month last year—135 males and 168 females. It is gratifying to know that the disease was not quite as destructive in August this year as in August last year.

September.—The tuberculosis deaths numbered 299, of which 255 were pulmonary and 44 other forms. Of the total number, 198 were females and 101 males. Of the females, 74 were married and in the age period of 18 to 40, and left 150 orphans under 12 years of age. The disease, therefore, in one month brought orphanage to 191 orphans under 12 years of age. Two hundred and thirty-seven homes were invaded by death by tuberculosis. Sixty-eight of the tuberculosis deaths were of persons over 50 years years of age and 192 were in the age period of 15 to 50, which is the working and productive period of life. Three con-

sumption deaths were of persons over 80 years of age. There were fewer tuberculosis deaths this September than in the same month last year.

October.—Tuberculosis deaths numbered 307, of which 252 were of the pulmonary form. Of the total number, 54 were women in the age period of 18 to 40, and left 111 orphans; 22 were males, were married and in the same age period as above, and they left 45 orphans. In all, this disease made 156 orphans in the month under 12 years of age, and invaded 286 homes; 219 of the 307 deaths, or 71 per cent., were in the age period of 15 to 50; 28 were in the age period of 60 to 70; 10 in the age period of 70 to 80, and two were over 80.

November.—The tuberculosis deaths numbered 344—300 being of the pulmonary form and 44 other forms. Of the total number, 75 were married women in the age period of 18 to 40, and they left 156 orphans, and 31 were married men in the same age period as above, and they left 68 orphans. All of these orphans were under 12 years of age. Doubtless some of them will find their way into orphan asylums to be cared for by the State for a number of years. The homes which were invaded by the disease numbered 315. One hundred and thirty-one, or 67 per cent., were in the age period of 15 to 50, which is recognized as the useful period of life. Fifteen persons over 70 years of age died of the disease, and three were 90 years old.

December.—The total deaths from tuberculosis were 336—298 being of the pulmonary form. Of this number, 192 were males and 144 females. Of the males, 27 were fathers in the age period of 18 to 40, and left 58 orphans under 12 years of age. Of the females, 63 were mothers, in the same age period as above, and left 128 orphans under 12 years of age. We have, therefore, to credit to this disease in one month the death of 90 fathers and mothers in the useful age period of life, and the creation of 186 orphans. How many of these will find their way into orphan asylums can not be told. The homes invaded by the disease numbered 326. One hundred and ninety of the deaths were in the age period of 15 to 50, 47 in the age period of 50 to 70, and 19 were 70 years and over.

PNEUMONIA.

Including pneumonia and broncho-pneumonia, pneumonia caused 3,246 deaths in 1905, and with the exception of 1904, when there were 3,723 deaths, this was the greatest number reported since 1900. The average deaths for the last six years was 3,123, rate 117.9 per 100,000. During the last six years the deaths certified as having been due to pneumonia have been as follows: 1900, 2,655, or 7.12 per cent. of the total deaths from all causes; 1901, 2,989, or 8.21 per cent.; 1902, 2,349, or 6.89 per cent.; 1903, 2,194, or 6.47 per cent.; 1904, 3,723, or 10 per cent.; 1905, 3,246, or 8.89 per cent. Pneumonia is second as a cause of death, consumption leading.

The following table gives a comparison of the number of deaths from pneumonia and consumption, with rates per 100,000, for the last six years, and also the average for the same for six years.

	1900.		1901.		1902.		1903.	
	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.
Pneumonia.....	2,655	105.5	2,989	118.7	2,349	93.3	2,194	86.3
Consumption.....	3,361	133.6	4,115	163.5	3,900	154.9	3,864	53.5

	1904.		1905.		Average 6 Yrs.	
	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.
Pneumonia.....	3,723	140.1	3,246	122.5	3,123	117.9
Consumption.....	4,436	166.9	3,998	150.9	3,946	148.9

Chart No. 7 shows the incidence of months with 1905, and also compares the same year with the last six years.

PNEUMONIA.

Comparison of 1905 with average of the last six years.

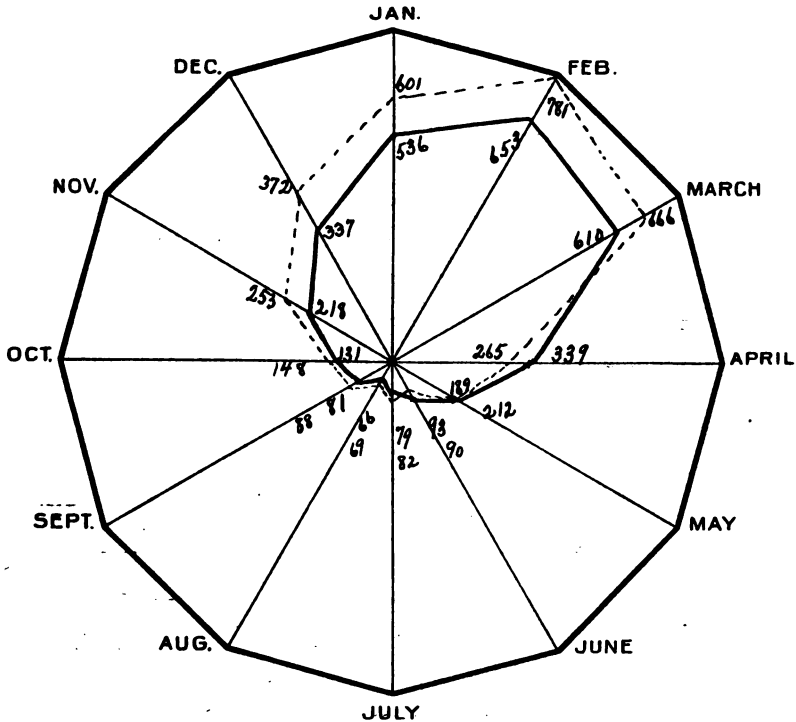


CHART No. 7.

—— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

Nine months show more than average.

Three months show less than average.

January, February and March had the greatest number of deaths from pneumonia in 1905. Chart No. 8 shows plainly, as represented in black columns, by months, when the greatest number of deaths occurred.

P N E U M O N I A

BY MONTHS 1905 INDIANA

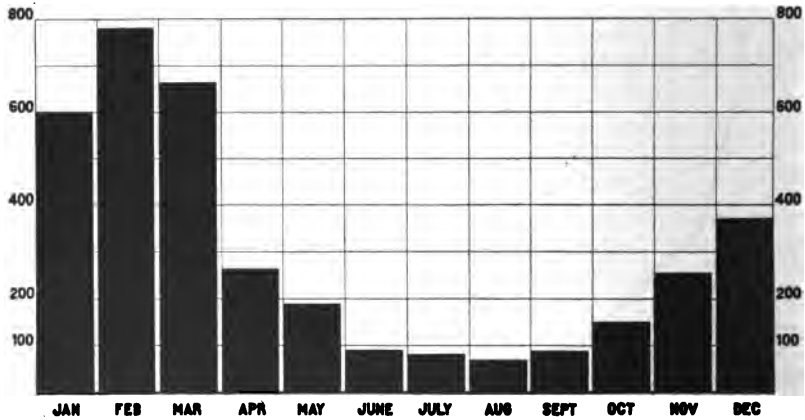


CHART No. 8.

Chart No. 9 shows graphically the effect of pneumonia on ages, the greatest number of deaths being of infants under one year of age.

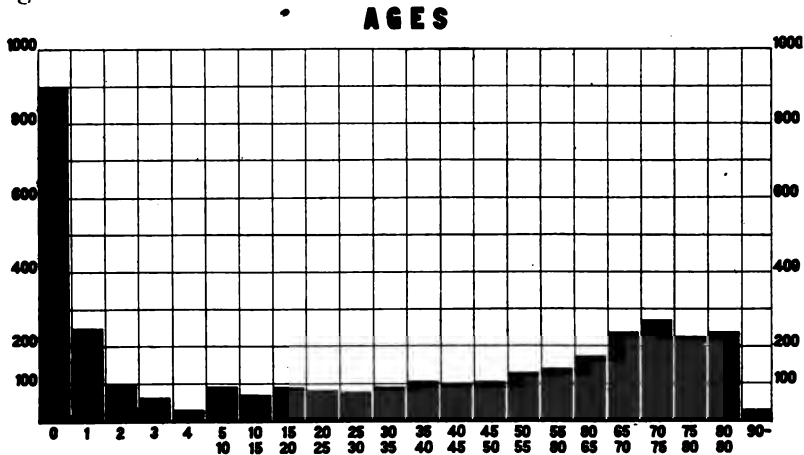


CHART No. 9.

Chart No. 10 gives a comparison of pneumonia deaths by months for 1905, with an average for the last six years.

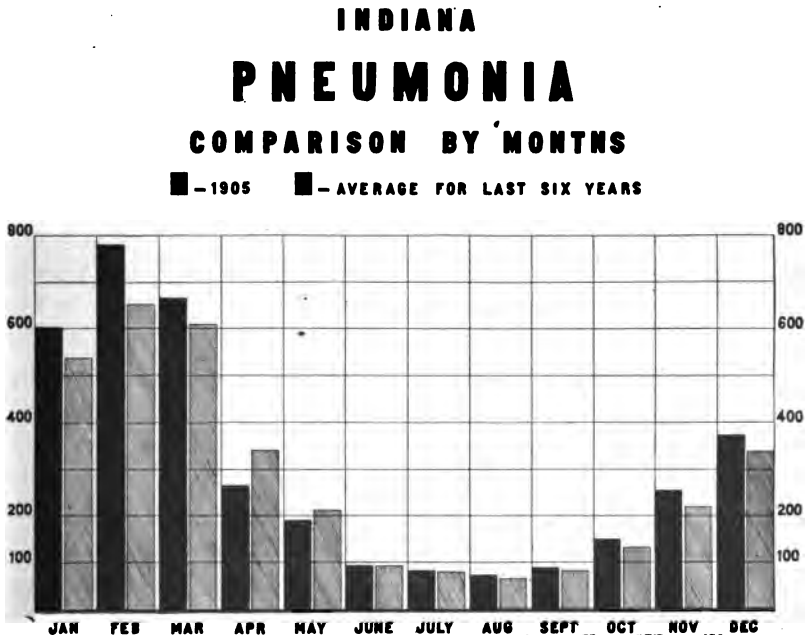


CHART No. 10.

Chart No. 11 shows how pneumonia affects ages, and gives the average number of deaths for the last six years. Black columns are for 1905—lined columns are for average.

COMPARISON BY AGES

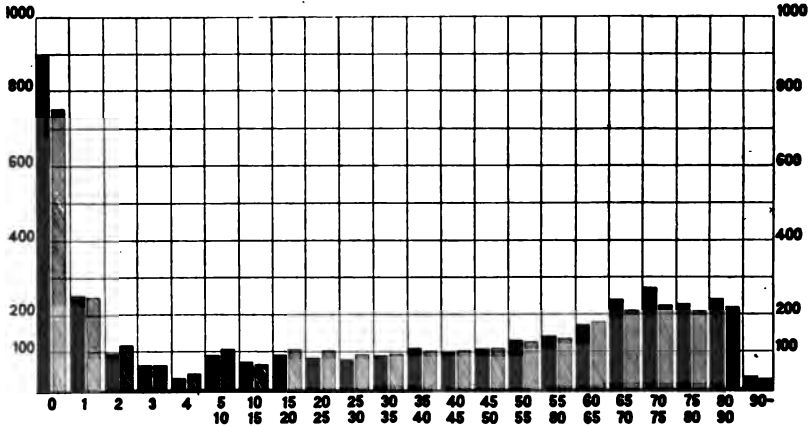


CHART No. 11.

The following is a record of pneumonia by months for the year 1905:

January.—Pneumonia deaths numbered five hundred and fifty-eight, a rate of 248.6 per 100,000. In the preceding month, three hundred and fifty-one deaths, rate 155.9. In the corresponding month last year, five hundred and forty deaths, rate 243.2. Of the total deaths, 140 were under one year of age; 89 were between the ages of 20 and 40; 156 were between the ages of 50 and 70; 75 were between 70 and 80; 41 between 80 and 90; and 2 were over 90 years of age.

February.—The pneumonia deaths numbered 741, rate 362.2. In the preceding month, 558, rate 248.6. In the corresponding month last year 711 deaths, rate 355.9. Of the total deaths, 221 were under 1 year of age, 93 in the age period of 1 to 10; 33, 15 to 20; 69, 20 to 40; 36, 40 to 50; 46, 50 to 60; 92, 60 to 70; 111, 70 to 80, and 35 over 80 years of age.

March.—Pneumonia caused 599 deaths. In the corresponding month last year, 741 deaths. There is, therefore, an improvement to record. Of the total number of deaths this month 312 were

males and 277 females. One hundred and eighty-one were under 1 year; 79 from 1 to 5; 41, 5 to 20; 71, 20 to 50; 101, 50 to 70; 122, 70 to 90, and 4 were over 90.

April.—Pneumonia caused 223 deaths. In the corresponding month last year, 557 deaths. There is an enormous improvement by this comparison. Of the total number of pneumonia deaths this month, 120 were males and 103 females. Forty-two were under 1 year; 27 in the age period of 1 to 5; 32 in the age period of 5 to 30; 29 from 30 to 50; 42 from 50 to 70; 53 from 70 to 90.

May.—Pneumonia caused 171 deaths. In the corresponding month last year, 319 deaths. Of the pneumonia deaths this month, 72 were females and 99 males. Thirty-two were under one year of age, 22 between 1 and 5, 14 between 5 and 20, 10 between 20 and 30, 28 between 30 and 50. Deaths between 50 and 90 numbered 49, one being a man 94 years old.

June.—Pneumonia caused 91 deaths. In the corresponding month last year, 106 deaths. In the preceding month, 171 deaths. This is a decrease which it is a pleasure to record. Twenty-one of the pneumonia deaths occurred in infants under 1 year of age, 20 were between the ages of 15 and 40, 6 between 40 and 60, 27 between 60 and 80, and 5 over 80.

July.—Pneumonia caused 63 deaths. In the corresponding month last year, 85 deaths. In the preceding month, 91 deaths. Ten of the pneumonia deaths occurred in infants under 1 year of age and 14 between the ages of 1 and 5. The ravages of this disease are almost nil in the summer months as compared to the winter months. This disease generally prevails more extensively among males than females. This month 29 of the deaths were males and 32 females.

August.—Pneumonia caused 61 deaths, 35 females and 26 males. Twelve deaths occurred in infants under 1 year of age; 11 in the age period of 1 to 5; 11 in the age period of 20 to 50. There will be an increase of this disease next month, for people will cease to live the out-door life on account of the coming cold and this, as is well known, brings on the disease.

September.—Pneumonia deaths numbered 85, an increase of 14 over the corresponding month last year. Thirty-eight of the deaths were males and 45 females. This is unusual, for generally

more males than females die of this disease. Of the total deaths, 20 were under 1 year of age, 13 between 1 and 5, and 16 in the age period of 20 to 50. There were three deaths of persons over 80 years of age.

October.—Pneumonia caused 138 deaths, 71 males and 67 females. By certain age periods, the deaths were: Under 1 year, 21; 1 to 5, 27; over 40, 66. There were 13 deaths by pneumonia of persons between 80 and 90, and one over 90 years of age. In the same month last year there were 108 deaths from pneumonia.

November.—Pneumonia caused 219 deaths. In the corresponding month last year, 229 deaths, and in the preceding month 138 deaths. We are pleased that the deaths this month did not number more than 219, for we expected by comparison with preceding Novembers there would be over 300 deaths. The large number of clear, sunshiny days inducing out-of-door life is probably the cause of this less than ordinary number of deaths. Of the 219 deaths 112 were females and 107 males. In certain age periods the deaths were: Under 1 year of age, 35; 1 to 5, 36; 5 to 20, 26; 20 to 50, 45; over 50, 100. Twenty-six persons over 80 years of age and 4 over 90 succumbed to the disease.

December.—Pneumonia caused 347 deaths; rate, 154.5 per 100,000. In the preceding month, 219 deaths; rate, 100.8. In the corresponding month last year, 351 deaths; rate, 155.9. Infancy and old age claimed the greater number of pneumonia deaths. One hundred and nineteen were under 5 years of age, and 112 over 50. There were 5 deaths of persons over 90 years of age.

TYPHOID FEVER.

In 1905 there were 928 deaths from typhoid fever, rate 30.5, which is the lowest rate since 1899. There has been a gradual decrease of deaths from typhoid, and this fact is probably due to a more general knowledge of the hygiene of the disease. The greatest number of deaths occurred in September, and the lowest in April. The following charts are self-explanatory:

August, September, October and November seem to be the fatal months from typhoid fever, as shown by Chart No. 12.

TYPHOID FEVER

BY MONTHS 1905
INDIANA

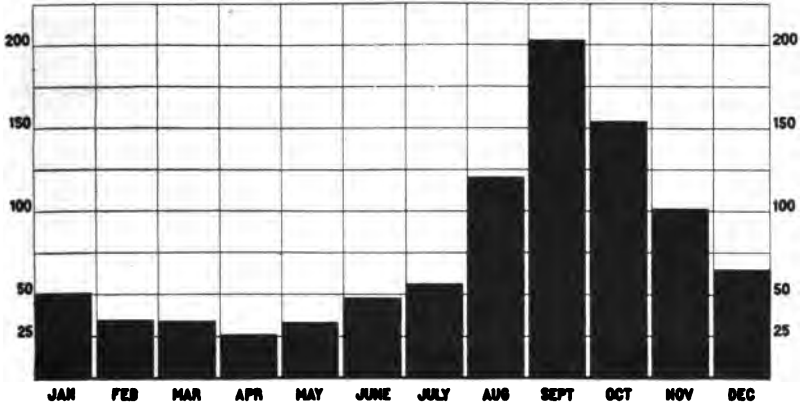


CHART No. 12.

Chart No. 13 gives the number of deaths by ages for the year 1905. Between the ages of 15 and 30 seem to be the most fatal period.

AGES

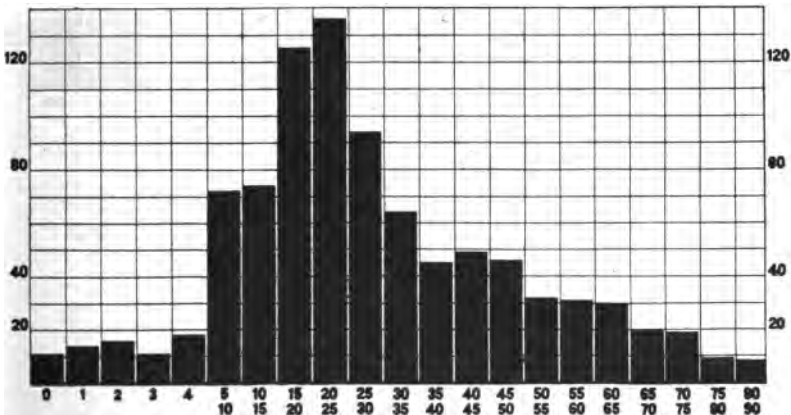


CHART No. 13.

Charts Nos. 14 and 16 give typhoid deaths by months, and give the average number of deaths for the last six years.

TYPHOID FEVER

COMPARISON BY MONTHS INDIANA

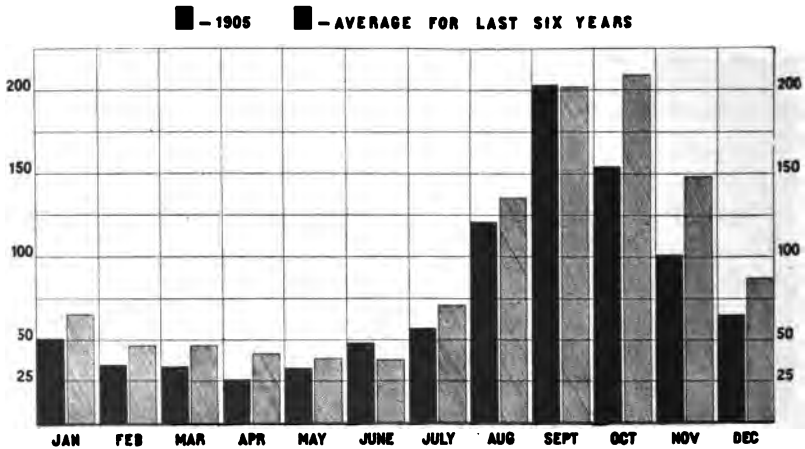


CHART No. 14

TYPHOID FEVER.

Comparison of 1905 with average of the last six years.

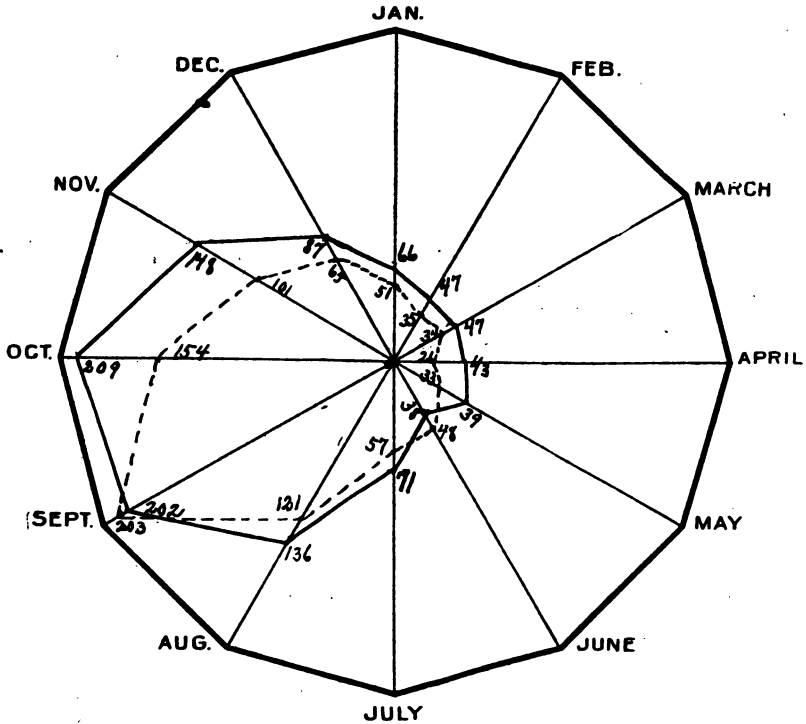


CHART No. 15.

———— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

Two months show more than average.

Ten months show less than average.

Chart No. 16 gives a comparison of typhoid fever deaths by ages, with the average number of deaths for the past six years.

COMPARISON BY AGES

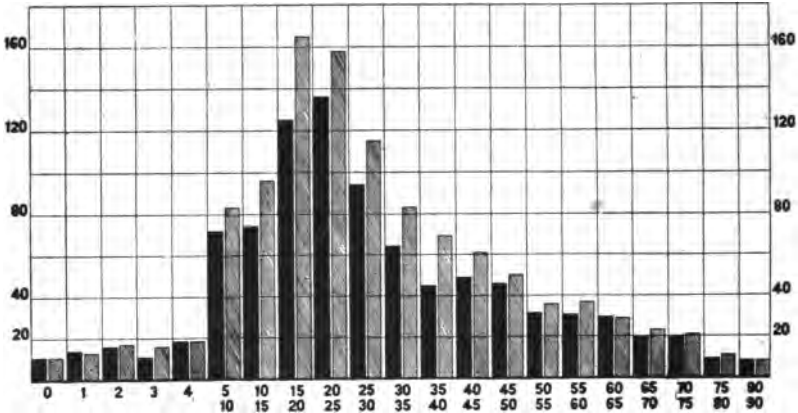


CHART No. 16.

TYPHOID FEVER.

Following is a monthly report of typhoid fever, showing the number of counties which reported the disease, and also the number of deaths during each month:

January.—Typhoid fever was reported from forty counties, and very probably existed in every one of our ninety-two counties. Two hundred and seventy-three cases were reported with fifty deaths. In the preceding month, three hundred and seventy-three cases, with 67 deaths. In the corresponding month last year, one hundred and eighty-two cases in 53 counties, with 38 deaths.

February.—Typhoid fever was reported from 42 counties, and very probably existed in every one of the 92. Two hundred and two cases were reported, with 32 deaths. In the preceding month 273 cases were reported, with 50 deaths. In the corresponding month last year, 268 cases and 60 deaths.

March.—This disease was reported in 37 counties, with 197 cases and 30 deaths. In the corresponding month last year, 55 deaths in 63 counties.

April.—This disease was reported in 25 counties, with 118

cases and 27 deaths. In the corresponding month last year there were reported 187 cases, with 56 deaths.

May.—This disease caused 32 deaths and only 59 cases were reported from 24 counties. It is obvious that all of the cases were not reported, and more is the pity. In the corresponding month last year there were reported 451 cases from 36 counties, with 49 deaths.

June.—Forty-five deaths and 156 cases in 50 counties were reported. In the corresponding month last year there were 59 cases reported, with 49 deaths.

July.—This disease has prevailed quite extensively throughout the State. Sixty-two deaths in all were reported. There were 180 cases reported from 55 counties.

August.—This disease has certainly increased over July to a very considerable degree. One hundred and twenty-five deaths were reported against 62 in July. It certainly was present in every county. The cases reported numbered 360, but this probably does not include $\frac{1}{2}$ of the cases which actually occur. It is safe to estimate the number of cases as 1,000. At the Indiana Soldiers' Home at Lafayette, it was found that only 4 cases of typhoid fever were recognized clinically, and of those diagnosed as "fever," "chills," "debility," etc., 62 showed the Widal reaction.

September.—Typhoid fever existed in every county in the State, and there were 189 deaths. In the corresponding month last year the disease existed in all but 14 counties, with 137 deaths. The cases reported numbered 1,027, probably one-half of the real number. This is an increase over the corresponding month last year, when 618 cases were reported. Two notable investigations were made, one by Deputy State Health Officer Dr. Ray Newcomb, in Kosciusko County, and the other by Deputy State Health Officer Dr. Helene Knabe, in Union and Fayette counties. The investigations of Dr. Newcomb were in the neighborhood of Etna Green, where he found 15 families infected and 27 cases. The spread of the disease in this region was clearly traced to filthy living. In Union and Fayette counties Dr. Knabe found 17 families infected with the disease and 31 cases, all clearly traceable to one family in which the disease was brought by the father from Missouri.

Both of these deputy health officers collected samples of water, which were analyzed in the State laboratory of hygiene, and all but one or two samples were found to be badly polluted. The wells from which they were taken were condemned. Instructions were given the people how to avoid typhoid fever and typhoid circulars were freely distributed. The editor of the *Liberty Herald* became greatly interested, and published, with illustrations, the entire typhoid circular of the State Board of Health.

October.—Typhoid fever existed in every county in the State, and there were 152 deaths. In the corresponding month last year, the disease existed in all but 14 counties, with 164 deaths. There is an improvement, therefore, by this comparison. Several considerable epidemics were reported, but were not especially investigated.

November.—Typhoid fever was reported from 62 counties and it is very likely indeed that cases could have been found in every county in the State. In the corresponding month last year, 61 counties reported 403 cases with 141 deaths, and November of this year the cases reported numbered 384 with 101 deaths. Several epidemics were reported. In Wayne County there were 15 cases with one death. There was also an epidemic of obscure bowel trouble. Some physicians thought this intestinal disease to probably bear some relation to la grippe. Other epidemics of this bowel trouble were reported from Marion, Tippecanoe and Putnam counties.

December.—This disease was reported from 47 counties, and it is not unlikely that cases existed in every county in the State. The cases reported numbered 306. Marked epidemics prevailed in Clark, Henry, Lake, Putnam, Vanderburgh and Washington counties. There were no reports in December of the "peculiar bowel disorder" which was reported in November from Marion, Wayne, Tippecanoe and Putnam counties.

DIPHTHERIA.

The number of deaths caused by diphtheria was 328, rate 12.3 per 100,000. There was an increase over 1904 of 44, and the average for the past six years was 445, with a rate of 16.80 per 100,000. The greatest number of deaths occurred during the

months of October, November and December, 160 being reported for those months, and 168 for the remaining nine months. The most fatal period was between the ages of 5 to 10, in which there were 110 deaths. There were two deaths between the ages of 55-60.

Chart No. 17 shows the deaths from diphtheria and croup by months, for 1905, and also compares 1905 with the average for the last six years.

DIPHTHERIA AND CROUP.

Comparison of 1905 with average of the last six years.

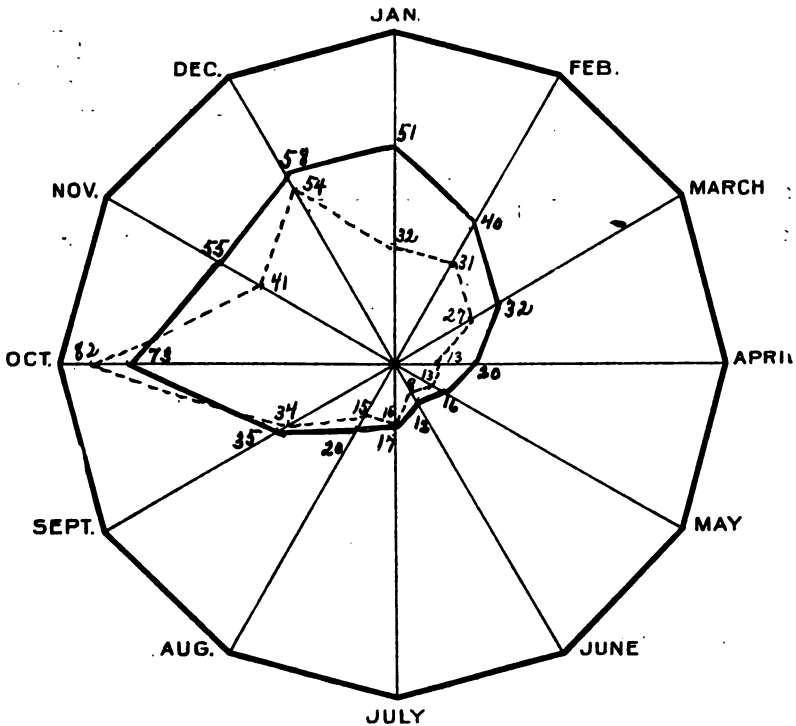


CHART No. 17.

———— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

Two months show more than average.

Ten months show less than average.

Chart No. 18 shows diphtheria deaths by months for the year 1905.

DIPHTHERIA AND CROUP

BY MONTHS 1905
INDIANA

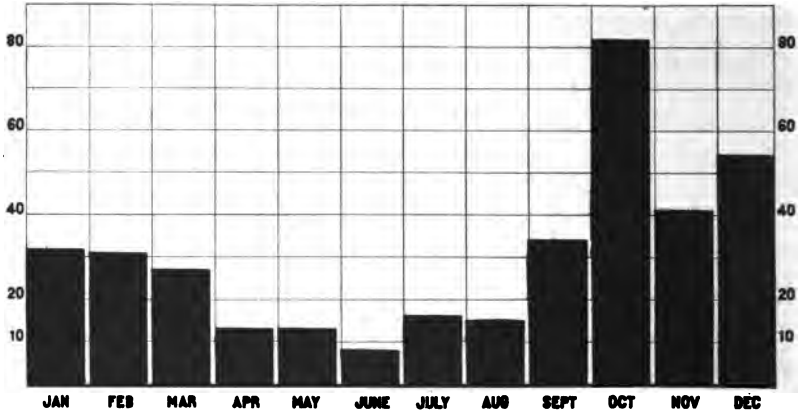


CHART No. 18.

Chart No. 19 shows diphtheria deaths by ages for the year 1905.

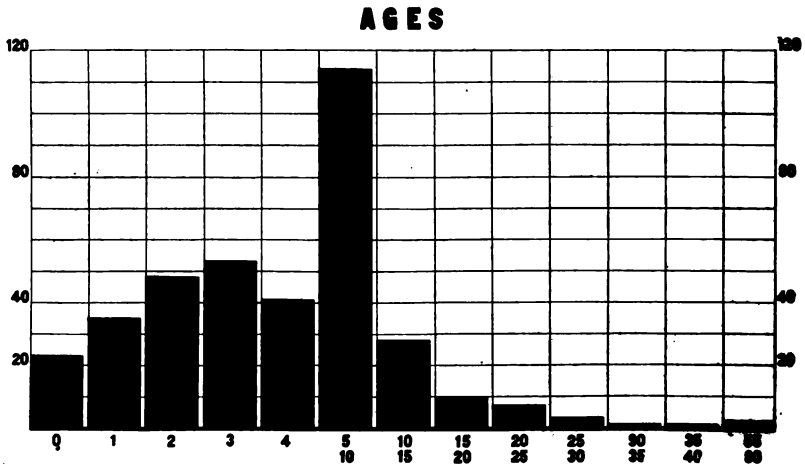
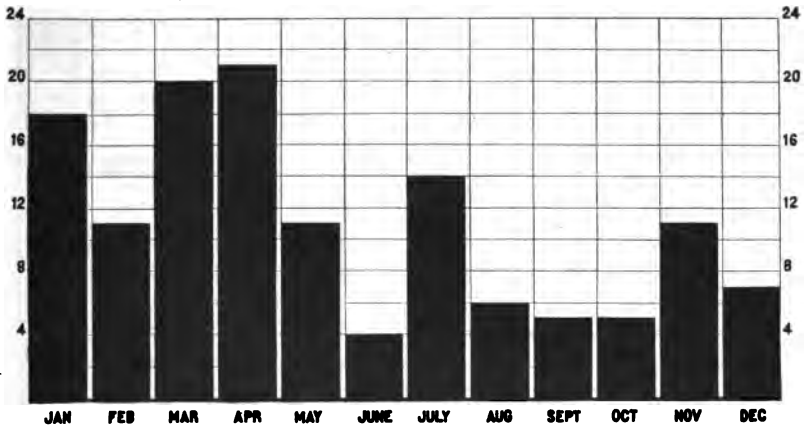


CHART No. 19.

SCARLET FEVER.

There were 133 deaths from scarlet fever, a decrease of 59 from last year, when there were 192 deaths. January, March and April were the fatal months, as shown by Chart No. 20, and the greatest number of deaths occurred in the age period of 5 to 10 years, as shown by Chart No. 21. Chart No. 22 is a comparison of the deaths for 1905 with the average for the last six years.

SCARLET FEVER**BY MONTHS 1905****INDIANA****CHART No. 20.**

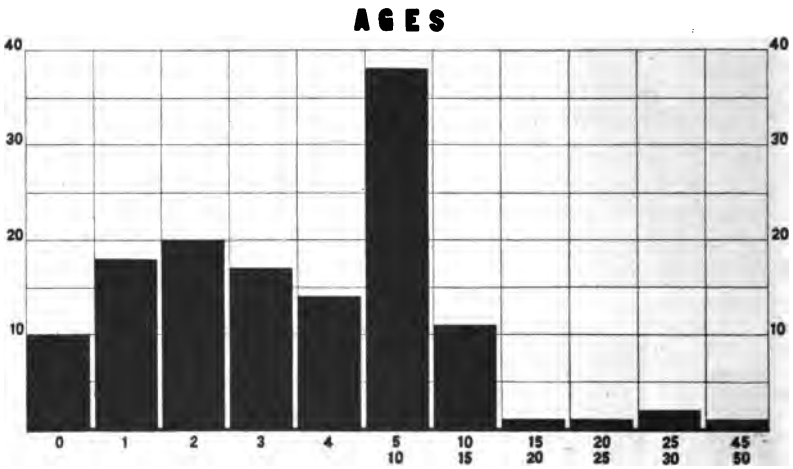


CHART No. 21.

SCARLET FEVER.

Comparison of 1905 with average of the last six years.

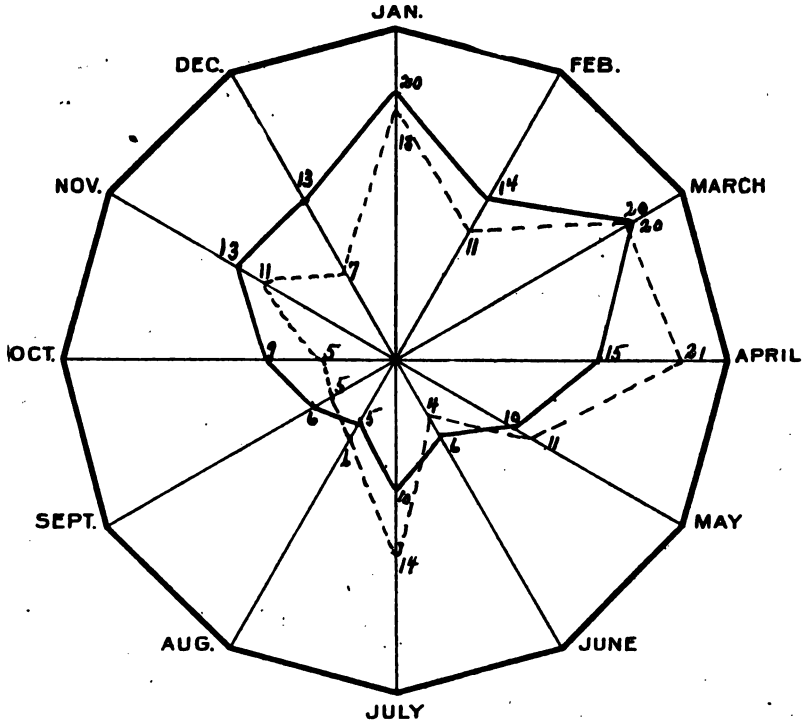


CHART No. 22.

———— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

Four months show more than average.

Seven months show less than average.

One month is same as average.

There were 69 scarlet fever deaths under five years of age, 38 from 5 to 10, 15 between the ages of 10 and 30. One death was reported between the ages of 45-50.

MEASLES.

There were only six deaths reported from measles for the entire year of 1905, which is the lowest number reported to this office since 1899. The rate was .2 per 100,000. In 1904 there were 212 deaths, with a rate of 7.9 per 100,000. Of the six deaths reported, three were under one year of age, one was 1 year, one 50-55, and one age not reported. The deaths occurred one in February, two in April, one in June, one in August and one in November.

DIARRHEAL DISEASES.

Diarrhea and enteritis includes dysentery, which caused 218 deaths in 1905, with a rate of 8.2 per 100,000; in the preceding year there were 184 deaths, rate 6.9. The deaths from dysentery during the months of July, August, September and October were 4.6 per cent. of the total deaths from all causes. The average deaths for the past six years was 246, rate 9.2 per 100,000. Of the total number of deaths from dysentery, 186 were over 50 years of age, or 85 per cent. of the whole number.

Diarrhea and Enteritis Under Five Years.—There were 1,700 deaths from this disease, with a rate of 64.1 per 100,000. The greatest number of deaths occurred in August, when there were 469. In July there were 359, and in September, 343. The deaths for the last three months were 3.2 per cent. of the total number of deaths from all causes, and 6.9 per cent. of the total number of deaths from this disease. There were 1,115 under one year of age, or 6.5 per cent. of the whole number. There were 6,041 deaths of infants under one year of age, exclusive of stillbirths, and of this number 1.8 per cent. died of infantile diarrhea.

Chart No. 23 gives the number of deaths by months for the year 1905 and the average number of deaths for the past six years.

DIARRHEAL DISEASES UNDER FIVE YEARS.

Comparison of 1905 with average of the last six years.

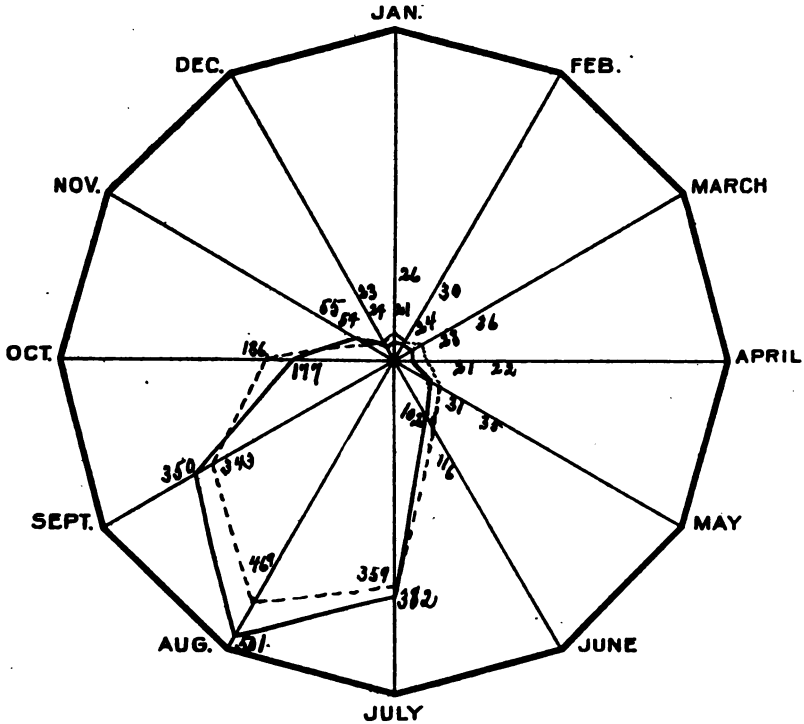


CHART No. 23.

———— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

Eight months show more than average.

Four months show less than average.

Chart No. 24 gives the number of deaths from infantile diarrhoea by months, and Chart No. 25 gives deaths from diarrheal diseases by ages for the year 1905.

DIARRHOEAL DISEASES

BY MONTHS 1905

INDIANA

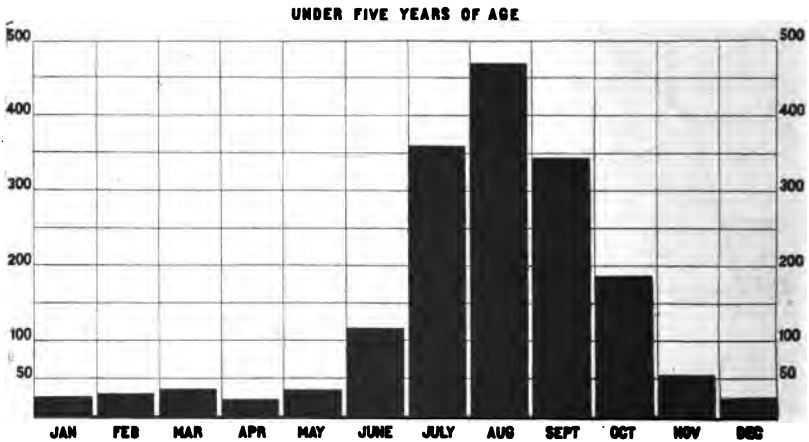


CHART No. 24.

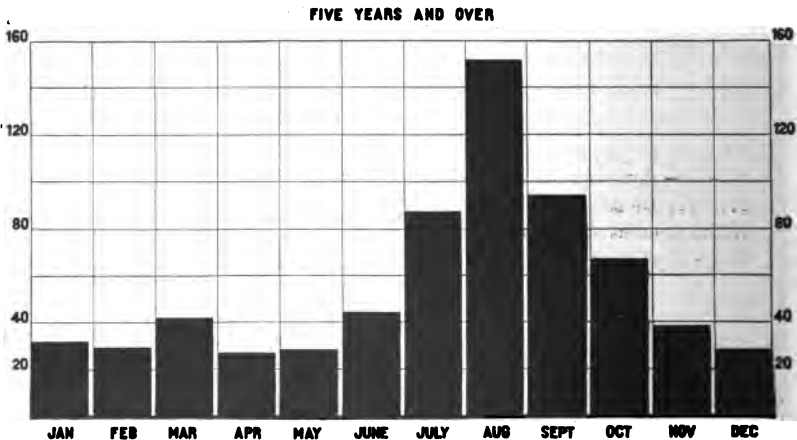


CHART No. 25.

Diarrhea and Enteritis Over Five Years.—There were 316 deaths from this disease, and 108 deaths from chronic diarrhea, making a total of 424, with a rate of 15.9 per 100,000. In the preceding year there were 409 deaths with a rate of 15.3 per 100,000. As usual the greatest number of deaths occurred in the age period of 60 years and over, and during the months of July, August and September. Chart 26 shows deaths by months for the year 1905.

DIARRHOEAL DISEASES

BY AGES 1905
INDIANA

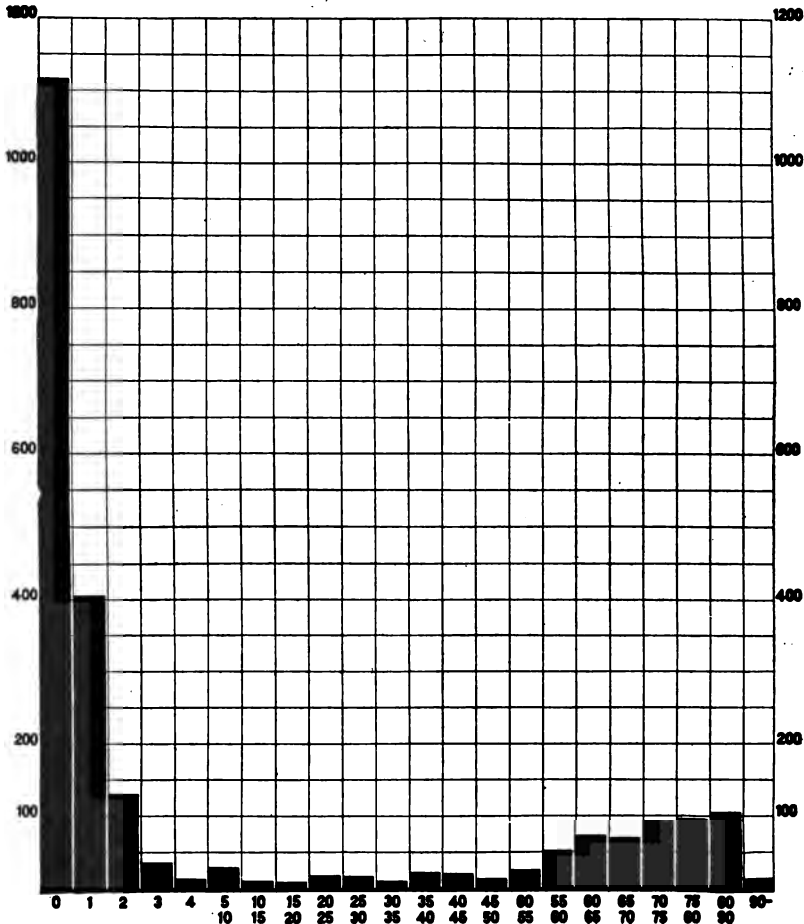


CHART No. 26.

DEATHS BY MONTHS, 1905, FROM DIARRHOEAL DISEASES, ALL KINDS.

MONTHS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Dysentery.....	5	2	7	4	4	9	34	61	56	24	11	1
Diarrhoea and Enteritis under 5 years.....	26	30	36	22	35	116	359	468	343	186	54	24
Diarrhoea and Enteritis, 5 years and over.....	11	26	27	19	14	25	30	62	28	33	23	18
Chronic Diarrhoea.....	16	1	8	3	9	8	13	24	3	10	11	11
Total.....	58	59	78	48	62	158	436	616	430	253	99	54

CANCER.

The total number of deaths reported from cancer, which term includes all kinds of cancers and malignant tumors, was 1,424, with a rate of 53.7 per 100,000. For the preceding year there were 1,259 deaths reported, with a rate of 47.7 per 100,000. There was a decided increase in the number of deaths from cancer during the year 1905, there being 165 more reported than in 1904. No new facts have developed during the year to explain the increase, although efforts are being made along that line. The greatest number of deaths were caused from cancer of the stomach, 519, or 19.5 per cent. dying from that disease. The greatest number of deaths occurred between the ages of 65 and 70, when there were 201 deaths, or 14 per cent. of the total number of deaths from this disease. There were 1,091 deaths between the ages of 50 and 80 years, and six deaths, of 90 years and over. The following table gives the number of deaths from cancer by ages for the year 1905.

AGES.	0	1	2	3	4	5 to 10	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45
Number of deaths	1	1	2	6	3	4	2	5	7	12	28	45	85

AGES.	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80	80 to 90	90 and over.
Number of deaths	118	151	165	189	201	176	128	81	6

Chart No. 27 shows the incidence of cancer by months, and compares 1905 with the average for the past six years, showing a plain increase.

CANCER.

Comparison of 1905 with average of the last six years.

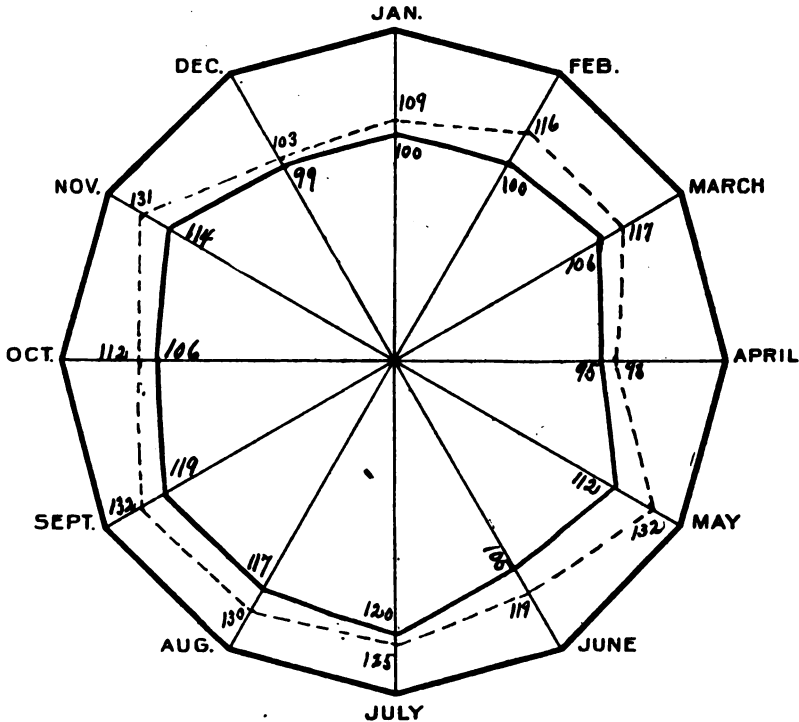


CHART No. 27.

———— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

All twelve months show more than average.

Chart No. 28 compares cancer, tuberculosis and typhoid deaths by congressional districts, these divisions being selected because they are very nearly equal in population. The table following the chart gives the figures for the same. It seems that the cancer death rate is dependent to some degree upon the skill at diagnosis of the physician, for it appears that in those districts best provided with hospitals and writers upon medical topics, the cancer death rates are highest. One theory is to the effect that stagnant water is in some way connected with cancer. This seems to be the case to some degree in Indiana, because the highest cancer death rates occur in the extreme northern counties of the State where lakes, ponds and marsh areas exist to the greatest degree.

INFLUENZA.

Influenza caused 591 deaths, a rate of 22.3 per 100,000. This is an increase of 157 over 1904. During the preceding year there were 434 deaths, with a rate of 16.3 per 100,000. During January, February and March there were 486 deaths, which is 8.2 per cent. of the total number of deaths from this disease. Chart No. 29 shows how influenza is affected by months, and Chart No. 30 shows how it affects ages. The greatest number of deaths occurred in persons over 60 years of age, as shown by Chart No. 30. There were 43 deaths of infants under one year of age from influenza.

**CHART SHOWING DEATH RATES IN INDIANA IN 1905 BY CONGRESSIONAL DISTRICTS OF
CANCER, TYPHOID FEVER AND TUBERCULOSIS**

INFLUENZA

BY MONTHS 1905
INDIANA

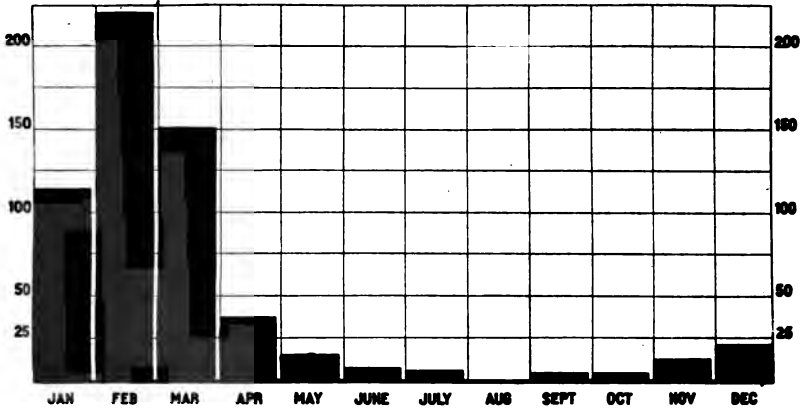


CHART No. 29.

AGES

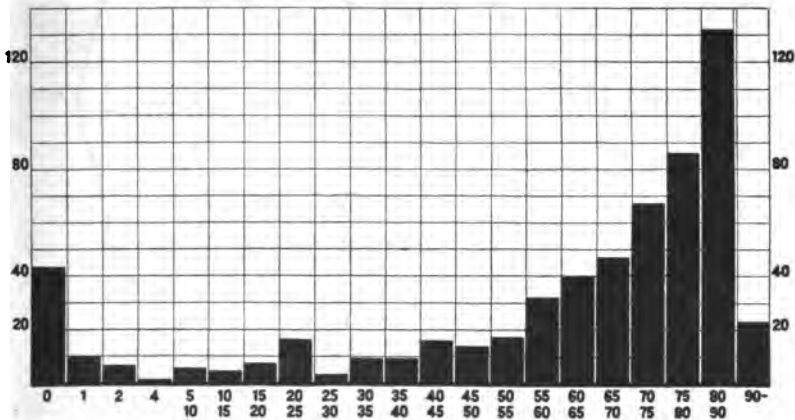


CHART No. 30.

VIOLENCE.

Violence includes accidents, suicides and homicides. There were 1,628 deaths from accidents, which includes fractures, dislocations, burning, sunstroke, freezing, electrical shock, drowning, inhalation of noxious gases, acute poisonings, and other accidents.

There were 84 homicides reported, a rate of 3.1 per 100,000.

There were 314 suicides, a rate of 11.8 per 100,000. Suicides include poison, asphyxia, hanging or strangulation, drowning, fire-arms, cutting instruments, jumping from high places, crushing and other suicides. There was one death from mob violence. Chart No. 31 gives deaths from violence by months, and compares 1905 with average deaths for the past six years.

VIOLENCE.

Comparison of 1905 with average of the last six years.

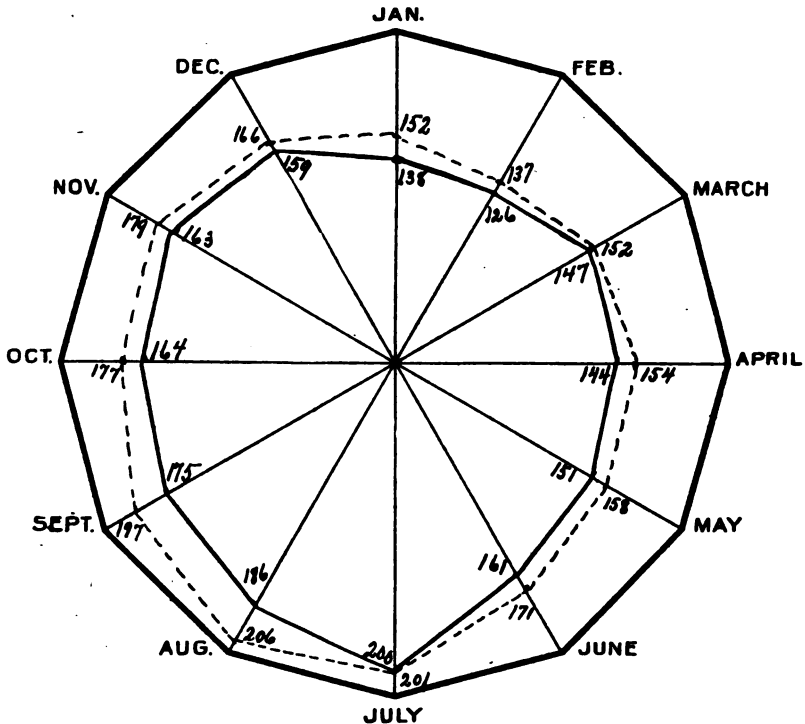


CHART No. 31.

—— Average deaths per month for six years, 1900-1905.

..... Deaths per month for the year 1905.

All twelve months show more than average.

The following is a record of deaths from violence by months for the year 1905:

January.—The deaths by violence numbered 132, 4 murders, 17 suicides and 115 accidents. Of the total number, 94 were males and 38 females. The murders were accomplished by gun shots, stabbing and poison. Of the suicides, 7 males chose gun shots. One male and 1 female chose hanging; 1 female, drowning; 1 male and 2 females, poison; 2 females, paris green; 1 male and 1 female, carbolic acid. Of the accidental deaths, 22 were by railroad accidents, 21 of the number being males. Crushing injuries killed 25; explosions, 4; animals, 1; mining, 3; machinery, 10; burns and scalds, 17; gun shots, 11; drowning, 1; dynamite, 2; freezing, 2; felling trees, 3.

February.—The deaths by violence numbered 127. No murders, 28 suicides, and the remainder accidents. Of the 28 suicides 11 were females, 17 males. Methods chosen were: Hanging, 3 males and 2 females; drowning, 1 female; gun shots, 9 males and 3 females; cutting throat, 1 female; chloroform, 1 male; opium poison, 3 males; corrosive sublimate, 2 males and 3 females. Some of the causes of the accidental deaths were: Railroads, 15 males; trolley lines, 1 male; fracture of skull and bones, 12 males and 2 females; burns and scalds, 9 males, 13 females; gun shots, 6 males, 1 female; poisons, 4 males; falling trees, 3 males; drowning, 3 males, 2 females; automobile, 1 female.

March.—There were 149 deaths from violence during the month—29 females and 120 males. In the corresponding month last year, 141 deaths—105 males and 36 females. Of the violence deaths this month 2 were murders, 37 suicides and the remainder accidents. The murders were caused by shooting, and of the suicides 10 were by shooting, 4 by hanging, 6 by carbolic acid, 4 by morphine, 1 by street-car, 1 by refusing to eat, and the remainder by various poisons. Of the accidental deaths 28 were by steam railways, 3 by street and trolley cars, 15 by burns and scalds, 6 by gun shots, 11 by fractured bones, 2 by electricity, 3 by vehicles, 6 by poisons, 9 by coal mine accidents, 5 by drowning, and the remainder by various ways.

April.—There were 113 deaths by violence during the month—86 males and 27 females. In the corresponding month last year,

137 deaths—102 males and 35 females. Of the total deaths this month, 2 were murders, 27 suicides and the remainder accidents. The murders were caused by shooting. Of the suicides, 10 were by shooting, 5 by hanging, 3 by opium and morphine, 5 by carbolic acid, 3 by strychnine and 1 by method not named. Of the accidental deaths, 19 were by railroads, 2 by trolley cars, 20 by fractured bones and crushing injuries, 2 by gun shots, 10 by burns and scalds, 7 by horses and vehicles, 4 by falls, 3 by mining, 1 by lightning, 4 by drowning, 5 by poisons, and the remainder by various ways.

May.—There were 140 deaths by violence during the month, 30 females and 110 males. There were 5 murders, 23 suicides, and the remainder accidental deaths. The murders were by gun shots and stabbing. The suicides were 7 females and 17 males. Carbolic acid was chosen by 5 males and 4 females; hanging by 4 males and 1 female; gun shots by 4 males, and drowning by 1 female. Of the accidental deaths, 32 were males and killed by railroads; gun shots caused 6 accidental deaths; electricity and lightning, 11; fracture of skull and bones, 21; poison, 4; burns and scalds, 5; drowning 20.

June.—There were 160 deaths from violence. There were 11 murders, 21 suicides and 128 accidents. Of the 11 murders, 8 were males and 3 females. Nine were accomplished by shooting and the remainder by stabbing. Of the 21 suicides, 14 were males and 7 females. Five chose shooting, 4 hanging, 2 drowning, 3 morphine and 7 poisons. Of the accidental deaths, 23 occurred on railroads, and all were males; 24 were drowned, 22 being males. Eight were killed by lightning, 26 by crushing injuries, 5 by burns and scalds, 3 by gun shots, 9 by falls, 8 by horses and vehicles, 4 by heat prostration, 4 by morphine, 5 by accidents in coal mines.

July.—There were 177 deaths from violence. Of these, 11 were murders, 24 suicides and the remainder accidental. Of the suicides, 9 were accomplished by hanging, 5 by gun shots, 1 drowning, 7 poisons and 5 by methods not named. One suicide employed shooting, cutting throat and poison. Of the accidental deaths, 26 were caused by steam railroads, 5 by interurban roads, 20 by drowning, 6 gun shots, 18 by crushing injuries, 4 burns and

scalds, 5 by lightning, 2 by electricity, 4 by sunstroke, 2 by ptomaine poison, 4 by tetanus and 1 by automobile.

August.—There were 193 deaths from violence. Of these, 7 were murders, 34 suicides and the remainder accidental. The methods chosen by the suicides were: Carbolic acid, 14, of which 9 were males and 5 females; pistol shots, 6 males; poisons, 12—males, 5, and females, 7; drowning, 2. Of the accidental deaths, 24 occurred on railroads; 29 were from crushing and falling injuries; electricity and lightning, 8; drowning, 27; burns and scalds, 11; sun-stroke, 3; gun shot, 11; mining accidents, 6; horses and wagons, 5; poisons, 4; and the remainder by various means.

September.—One hundred and eighty-six deaths by violence were reported. Of this number, 17 were murders—10 males and 7 females; 27 were suicides—19 males and 8 females; 138 were accidental deaths—107 males and 31 females. Of the murders, 10 were by shooting, 1 by cutting throat, 5 by blows with hatchet and 1 by fracture of skull. Of the suicides, 9 were by gunshots, 11 by poisons, 3 by hanging, 2 by drowning, 2 by asphyxiation. Of the accidental deaths, 32 were on railroads, 5 on trolley cars, 14 by drowning, 10 by gun shots, 25 by fractures, 13 by burns and scalds, 9 by poisons, 1 by lightning, 8 by falls, 1 by horses, and the remainder in various other ways.

October.—There were reported 155 deaths from violence—9 murders, 30 suicides and the remainder accidents; 121 of the violence deaths were males and 34 females. All of the murders were of males, 5 being killed with fire-arms, 1 by cutting, 2 by blunt instruments and 1 justifiable homicide. Of the 30 suicides, 18 were males and 12 females. The methods used were: Gun shots, 6 males and 2 females; drowning, 1 female; cutting throat, 1 female; hanging, 6 males and 1 female; poisons, 6 males and 7 females. Of the accidental deaths, 31 were on railroads; 2 on interurban trolleys; 25 fractured bones or crushing injuries; 8 by gun shots; 3 by broken necks; burns and scalds, 10; burning, 5; horses and vehicles, 4; poisons, 9; mine accidents, 4; powder explosions, 2.

November.—Of the 159 violent deaths 10 were murders, 27 suicides and the remainder accidental. Of the 10 murders all were males, 6 were killed by shooting and 4 by stabbing. Of the 27

suicides 20 mere males and 7 females. Six chose shooting, 1 cutting throat, 5 hanging, 1 burning herself with coal oil, 6 with carbolic acid and 8 with other poisons. Of the accidental deaths 37 were killed by steam railroads; females, 3; males, 34. Street cars and interurbans killed one male. Thirty-six were killed by crushing injuries, 7 by gun shots, 24 by burns and scalds, 1 by electricity, 2 by horses and vehicles, 4 by mining accidents, 3 by explosions and the remainder in various ways.

December.—Of the 137 violent deaths, 35 were females and 102 males. Five were murders, 20 suicides, and the remainder accidental. All five of the murders were by gun shots. Of the suicides, 7 took carbolic acid (3 males, 4 females); four males poisoned themselves with opium or other poisons; other methods used were shooting, 1 (a male; hanging, 2 (both males); cutting throat, 2 (both females). Of the accidental deaths, steam railway trains killed 25, one of them being a female; street cars and interurbans killed 2, both males; 20 were killed by crushing injuries, 24 by burns and scalds, 12 by gun shots, 3 by drowning, 8 by falls, 1 by horses, 6 by poison, 2 by explosions, 3 by suffocation and strangulation, and the remainder in various ways.

SMALLPOX.

There were only 35 deaths from smallpox in 1905, rate 1.3 per 100,000. In 1904, 97 deaths, rate 3.6 per 100,000. The monthly record of smallpox gives number of deaths, number of cases, and the counties invaded.

The following table gives the number of deaths by months for the last six years:

MONTHS.	1900.	1901.	1902.	1903.	1904.	1905.	Total	Average for Six Years.
January	1	2	4	51	8	7	73	12
February	4	2	2	55	5	11	79	13
March	2	4	3	31	3	3	46	8
April	3	1	8	21	6	3	42	7
May	2	3	1	10	7	3	26	4
June	2	3	2	3	3	4	17	3
July	3	1	15	4	6	3	32	5
August .....	.....	.....	1	14	3	.....	18	3
September	2	1	7	2	17	.....	29	5
October .....	.....	2	10	.....	18	.....	30	5
November .....	.....	1	4	.....	13	.....	19	3
December .....	.....	1	18	3	8	1	31	5
Total	19	21	75	195	97	35	442	74

SMALLPOX—RECORD BY MONTHS, 1905.

January.—Two hundred and thirty-eight cases with seven deaths in 27 counties. In the preceding month, 472 cases and 8 deaths in 38 counties. In the corresponding month last year, 480 cases with 8 deaths in 38 counties. We have therefore to record a decrease in cases and deaths, but a higher death rate. The counties invaded were: Adams, 5 cases and 1 death; Allen, 1 case; Boone, 32; Cass, 1; Clark, 6, with 1 death; Clay, 5; Clinton, 18; Crawford, 6; Daviess, 5; Delaware, 16; Dubois, 10, with 2 deaths; Floyd, 12; Gibson, 6; Grant, 1; Greene, 10, with 1 death; Harrison, 5; Hendricks, 5; Howard, 2; Lake, 1; Madison, 2; Marion, 2; Monroe, 3; Montgomery, 1; Parke, 5; Perry, 25; Spencer, 3; Sullivan, 32, with 2 deaths; Tipton, 1; Vanderburgh, 126; Washington, 5.

February.—Three hundred and eighty-one cases reported from 35 counties, with 8 deaths. In the preceding month, 238 cases from 27 counties, with 7 deaths. In the corresponding month last year, 408 cases in 34 counties and 5 deaths. By this last comparison we have to record a decrease in cases with an increase in deaths. The counties invaded were: Allen, 8 cases; Boone, 12; Daviess, 5, with 1 death; Delaware, 12; Floyd, 20; Grant, 7; Jay, 1; Lake, 3, with 1 death; Lawrence, 11; Madison, 23; Monroe, 5; Orange, 5; Posey, 2; Pulaski, 5; Shelby, 20; Spencer, 7; Sullivan, 20 cases and 2 deaths; Tippecanoe, 1 case; Union, 2; Vanderburgh, 128 cases and 1 death; Vermillion, 1; Vigo, 28 cases and 3 deaths.

March.—Two hundred and fifty-one cases in 29 counties, with 1 death, were reported. In the preceding month, 381 cases from 35 counties, with 8 deaths. In the corresponding month last year, 231 cases in 41 counties, with 3 deaths. The counties reporting the disease were: Allen, 6; Benton, 1; Blackford, 1; Boone, 4; Clark, 10; Clay, 2; Crawford, 5, with 1 death; Daviess, 1; Delaware, 5; Floyd, 4; Grant, 6; Henry, 3; Howard, 15; Kosciusko, 4; Madison, 24; Porter, 2; Shelby, 12; Spencer, 10; Steuben, 6; Sullivan, 20; Tippecanoe, 1; Tipton, 6; Union, 3; Vanderburgh, 12; Vermillion, 15; Warrick, —; Washington, 22. In Shelby County, the region north of Fairland presented the disease in epidemic form. Most of the cases were mild, al-

though a few were quite severe. A very considerable epidemic prevailed in Vanderburgh, Washington, Madison and Howard counties. Many physicians continue to fail to diagnose this disease. The newest diagnosis is from Sullivan County, where a pronounced case of smallpox was diagnosed as "pawpaw poisoning."

April.—One hundred and fifty-one cases of smallpox in 18 counties, with 4 deaths, were reported. In the preceding month there were 251 cases in 29 counties, with 1 death. In the corresponding month last year, 260 cases in 29 counties, with 6 deaths. The counties reporting the disease were: Allen, 4; Clark, 1 and 1 death; Delaware, 2 and 1 death; Elkhart, 2; Floyd, 20; Gibson, 1; Johnson, 1; Kosciusko, 1; Lawrence, 10; Madison, 25; Marion, 1 and 1 death; Shelby, 1; Spencer, 13; Sullivan, 5 and 1 death; Switzerland, 1; Tipton, 17; Vanderburgh, 25; Washington, 21. The one case and one death which occurred in Marion County acquired the infection in St. Louis. A Mrs. Akes, living in St. Louis, was attended by her mother, Mrs. Swails, from Indianapolis. The first-named lady died with what was reported to be "heart disease with pulmonary hemorrhage, complicated with bronchitis." The body of Mrs. Akes was embalmed, sent to Indianapolis for burial, and a public funeral held. In due time the mother, Mrs. Swails, was attacked with smallpox and died with the hemorrhagic form. This led to an investigation of the Akes death, and upon disinterment of the remains the diagnosis of hemorrhagic smallpox was evident.

It will be noted that smallpox was epidemic in Madison, Floyd, Vanderburgh and Washington counties. It also was almost certainly present in many of the counties which report it absent, for physicians still fail to diagnose this disease when in mild form.

May.—Twenty-five cases of smallpox in eleven counties with two deaths were reported. In the preceding month there were 151 cases in 18 counties, with 4 deaths. In the corresponding month last year, 259 cases in 36 counties, with 6 deaths. The counties reporting the disease were: Daviess, 1 case; Fayette, 2; Green, 3, with 1 death; Marshall, 1 case; Pike, 1; Posey, 2; Switzerland, 2; Tipton, 2. No cases of black smallpox were known to have occurred. This decrease, when compared with the corresponding month last year, is considerable, for it appears that

the number of cases decreased 90.3 per cent., the area invaded 62 per cent., and the deaths 66.6 per cent.

June.—One hundred and fourteen cases of smallpox in 13 counties, with 4 deaths, were reported. This is a decided increase over the preceding month, when there were 25 cases in 11 counties, with 2 deaths. In the corresponding month last year there were 127 cases in 27 counties, with 3 deaths. The counties reporting the disease were: Bartholomew, 6; Boone, 3; Brown, 16; Fayette, 3; Lawrence, 1; Madison, 13; Monroe, 5; Noble, 1; Pike, 3 cases; Starke, 4; St. Joseph, 21, with 4 deaths; Vanderburgh, 32 cases. The State Health Officer made two visits on account of smallpox, one to Connersville, Ind., and one to Columbus, Ind. All of the cases reported in Bartholomew County occurred at Columbus, and none of them severe. A case at Connersville, which caused considerable comment and excitement, proved to be chickenpox.

July.—Thirty-one cases of smallpox in 6 counties, with 3 deaths, were reported. In the corresponding month last year, 56 cases in 14 counties, with 3 deaths. In the preceding month, 114 cases in 13 counties, with 4 deaths. The counties reporting the disease present were: Blackford, 1 case; Gibson, 1; Marshall, 1; Bartholomew, 5; Brown, 5; Pike, 8, with 1 death; St. Joseph, 4 cases with 2 deaths; Vanderburgh, 3 cases, and Washington, 3 cases.

In a log house in Brown County, which was situated in a valley remote from the main road, the State Health Officer found a farmer and his wife with seven children all afflicted with smallpox. Two of the cases were almost well, having occurred in June. The log house contained only one room. The sky was visible in many places through holes in the roof and large gaping spaces existed between the logs. The floor was broken and general dilapidation existed. Three beds, two double and one single, supplied the sleeping facilities for the seven inmates. A stove, three broken chairs, and an old table with a meagre supply of crockery and cutlery supplied the furnishings of the home.

August.—Ten cases of smallpox, with no deaths, in 5 counties, were reported. In the corresponding month last year, there were 56 cases of smallpox in 14 counties, with 3 deaths. In the pre-

ceding month, 31 cases in 6 counties, with 3 deaths. The counties reporting cases this month were: Daviess, 1; Noble, 1; Steuben, 1; St. Joseph, 6; Vermillion, 1. These figures make it seem probable that smallpox is dying out and that Indiana has known the worst from this visitation.

September.—Nineteen cases of smallpox in 8 counties were reported, with no deaths. This is a slight increase over the preceding month, when there were only 10 cases in 5 counties, with no deaths. In September, 1904, there were reported 197 cases in 22 counties, with 12 deaths. The counties reporting the cases this month were: Dearborn, 6; Dubois, 2; Gibson, 1; Jasper, 1; Madison, 3; Marion, 4; Noble, 1; Washington, 1.

October.—Not a single case of smallpox was reported in the whole State for the month. It must not be concluded from this that there were no cases, for without doubt, not a few mild cases existed. Of course, no deaths were reported, and the fact that smallpox did not cause a single death is true.

November.—Eighty-four cases of smallpox were reported in five counties, namely: Allen, 61 cases; Clark, 1; Randolph, 1; Tippecanoe, 1; Washington, 20. The last named county has suffered from this disease quite steadily for the last five years. Vaccination has not been done owing to the mild nature of the disease. No smallpox deaths occurred.

December.—One hundred and twelve cases, with one death, were reported from 13 counties, namely: Allen, 33, 1 death; Boone, 4 cases; Dubois, 6; Jackson, 1; Jasper, 5; Johnson, 1; Martin, 1; Orange, 1; Switzerland, 20; Tippecanoe, 2; Washington, 22; Wayne, 1; Whitley, 8. In the corresponding month last year, 472 cases, with 8 deaths, in 38 counties. It is to be noted that mild smallpox seems to be endemic in Washington County, for the disease is reported every month in the year from this locality.

DISEASE PREVALENCE—RECORD BY MONTHS, 1905.

January.—The most prevalent malady during the month was influenza, and bronchitis, which was first in December, dropped to the fourth place. Pneumonia stood fifth in December, but second in January. The order of prevalence was as follows: In-

fluenza, pneumonia, tonsilitis, bronchitis, rheumatism, scarlet fever, pleuritis, diphtheria and membranous croup, typhoid fever (enteric), intermittent fever, smallpox, diarrhœa, erysipelas, inflammation of bowels, measles, whooping-cough, typho-malarial fever, cerebro-spinal meningitis, puerperal fever, dysentery, cholera morbus, cholera infantum.

February.—The most prevalent malady during the month was influenza. This was also true for January. The order of disease prevalence was as follows: Influenza, pneumonia, tonsilitis, bronchitis, rheumatism, scarlet fever, pleuritis, typhoid fever (enteric), erysipelas, diarrhœa, intermittent fever, diphtheria and membranous croup, inflammation of the bowels, smallpox, whooping-cough, measles, puerperal fever, typho-malarial fever, cholera morbus, dysentery, cerebro-spinal meningitis, cholera infantum.

March.—The most prevalent malady during the month was influenza, and this was true of the preceding month. Pneumonia stood fifth, while in the same month last year it stood first. The following is the order of prevalence: Influenza, rheumatism, tonsilitis, bronchitis, pneumonia, scarlet fever, pleuritis, diarrhœa, typhoid fever (enteric), intermittent and remittent fever, smallpox, erysipelas, diphtheria and membranous croup, puerperal fever, whooping-cough, inflammation of bowels, measles, typho-malarial fever, cerebro-spinal meningitis, dysentery, cholera infantum, cholera morbus.

April.—The most prevalent malady during the month was rheumatism. Influenza occupied this position in the preceding month, and pneumonia in the corresponding month last year. Pneumonia stands fifth this year and influenza fourth. The following is the order of prevalence: Rheumatism, tonsilitis, bronchitis, influenza, pneumonia, pleuritis, diarrhœa, erysipelas, intermittent and remittent fever, inflammation of bowels, scarlet fever, typhoid fever (enteric), smallpox, cholera morbus, whooping-cough, measles, puerperal fever, typho-malarial fever, dysentery, diphtheria and membranous croup, cerebro-spinal meningitis, cholera infantum.

May.—The most prevalent malady during the month was rheumatism, and this was the case in the preceding month. Diarrhœa was seventh in the preceding month and third this month. The

following is the order of disease prevalence: Rheumatism, tonsillitis, diarrhœa, bronchitis, influenza, intermittent and remittent fever, pneumonia, typhoid fever (enteric), pleuritis, scarlet fever, erysipelas, diphtheria and membranous croup, whooping-cough, smallpox, measles, typho-malarial fever, inflammation of bowels, cholera morbus, puerperal fever, dysentery, cholera infantum, cerebro-spinal meningitis.

June.—The reports show that rheumatism was the most prevalent disease during the month, and this was true in the two preceding months. Diarrhœa, which was third in the preceding month, rises to second place. Despite the warm weather, tonsillitis and bronchitis are still generally reported. The following is the order of disease prevalence: Rheumatism, diarrhœa, tonsillitis, bronchitis, intermittent and remittent fever, typhoid fever (enteric), cholera morbus, inflammation of the bowels, scarlet fever, cholera infantum, whooping-cough, dysentery, influenza, erysipelas, pleuritis, pneumonia, diphtheria and membranous croup, smallpox, typho-malarial fever, cerebro-spinal meningitis, puerperal fever, measles.

July.—The reports show that diarrhœa was the most prevalent disease during the month. Rheumatism was reported most prevalent in June, and diarrhea held third place. Tonsillitis, bronchitis and influenza prevailed only slightly. Following is the order of disease prevalence: Diarrhœa, cholera morbus, dysentery, rheumatism, cholera infantum, tonsillitis, typhoid fever (enteric), intermittent and remittent fever, inflammation of the bowels, scarlet fever, bronchitis, whooping-cough, typho-malarial fever, erysipelas, pleuritis, influenza, diphtheria and membranous croup, smallpox, pneumonia, measles, puerperal fever, cerebro-spinal meningitis.

August.—As in July, the reports show that diarrhea was the most prevalent disease during the month. Typhoid fever, which was seventh last month, rises to second place this month. Rheumatism remains prevalent, for it has only fallen from second to third place. On the whole, the health for August was not as good as for July. The following is the order of disease prevalence: Diarrhœa, typhoid fever (enteric), rheumatism, cholera morbus, tonsillitis, cholera infantum, dysentery, intermittent and

remittent fever, bronchitis, scarlet fever, typho-malarial fever, inflammation of bowels, diphtheria and membranous croup, erysipelas, pleuritis, pneumonia, influenza, whooping-cough, puerperal fever, cerebro-spinal meningitis, smallpox, measles.

September.—Typhoid fever, which stood seventh in the area of prevalence in July, arose to second place in August, and takes first place this month. Diarrhœa, which was first in August, fell to second place in September. Smallpox almost entirely disappeared, only 19 cases being reported. Following is the order of disease prevalence: Typhoid fever (enteric), diarrhœa, rheumatism, tonsilitis, intermittent and remittent fever, bronchitis, cholera morbus, dysentery, cholera infantum, scarlet fever, diphtheria and membranous croup, inflammation of bowels, typho-malarial fever, pneumonia, whooping-cough, pleuritis, erysipelas, influenza, cerebro-spinal meningitis, puerperal fever, smallpox, measles.

October.—Typhoid fever, as in the preceding month, was the most prevalent disease. It existed in every county. Rheumatism, which is always prevalent, stands second. On the whole, the health for October was as good as in September. The following is the order of disease prevalence: Typhoid fever (enteric), rheumatism, bronchitis, tonsilitis, influenza, scarlet fever, intermittent and remittent fever, diphtheria and membranous croup, diarrhea, pneumonia, pleuritis, erysipelas, typho-malarial fever, whooping-cough, inflammation of the bowels, dysentery, cholera morbus, cholera infantum, cerebro-spinal meningitis, puerperal fever, measles, smallpox.

November.—Typhoid fever, which was reported as the most prevalent disease in the two preceding months, fell to fourth place this month and bronchitis and tonsilitis were reported as the most prevalent diseases. Pneumonia and influenza were not as prevalent as expected as by comparison with previous Novembers. This was probably because of the great number of clear days of moderate temperature, permitting and encouraging more out-door life. The following is the order of disease prevalence: Bronchitis, tonsilitis, rheumatism, typhoid fever (enteric), pneumonia, influenza, diphtheria and membranous croup, scarlet fever, diarrhea, dysentery, pleuritis, fever (intermittent and remittent), ery-

sipelas, inflammation of bowels, whooping-cough, typho-malarial fever, puerperal fever, cholera infantum, cholera morbus, measles, cerebro-spinal meningitis, smallpox.

December.—Bronchitis and tonsilitis were reported the most prevalent diseases. This was also true for the preceding month, and again in the same month last year. While pneumonia was fifth in area of prevalence in December, 1904, it stood third in 1905. The following is the order of disease prevalence: Bronchitis, tonsilitis, pneumonia, rheumatism, influenza, typhoid fever, scarlet fever, pleuritis, diphtheria and membranous croup, intermittent and remittent fever, erysipelas, diarrhœa, whooping-cough, inflammation of bowels, smallpox, typho-malarial fever, puerperal fever, cerebro-spinal meningitis, dysentery, cholera infantum, measles, cholera morbus.

TABLES

OF

ANNUAL STATISTICAL REPORT

FOR THE YEAR 1905.

TABLE I.

*Deaths in Indiana During the Year Ending December 31, 1905,
Statistically Classified by the International System, with Rates
Per 100,000 Population, Estimated According to United States
Census Bureau.*

Classification Number.	CAUSES OF DEATH.	Number of Deaths.	Death Rate Per 100,000.
I. GENERAL DISEASES—EPIDEMICS.			
1	Typhoid fever	928	35.0
2	Exanthematous typhus	1	.03
3	Recurrent fever	1	.03
4	Intermittent and malarial fever	116	4.3
5	Varicella or smallpox	35	1.3
6	Measles	6	.2
7	Scarlatina	133	5.0
8	Whooping cough	136	5.1
9	Croup	38	1.4
9a	Diphtheria	328	12.3
10	Influenza	591	22.3
11	Miliary fever		
12	Asiatic cholera		
13	Cholera nostras	26	.9
14	Dysentery	218	8.2
15	Bubonic plague		
16	Yellow fever	1	.03
17	Dropsy		
18	Erysipelas	107	4.0
19	Other epidemic diseases	2	.07
20	Purulent septicemia and infection	285	10.7
21	Glanders and farcy		
22	Malignant pustule and anthrax	2	.07
23	Rabies	3	.1
24	Actinomycosis, trichinosis, etc.		
25	Pellegra		
26	Tuberculosis of the larynx	58	2.1
27	Tuberculosis of the lungs	3,940	148.7
28	Tuberculosis of the meninges	151	5.7
29	Abdominal tuberculosis	207	7.8

TABLE I—Continued.

Classification Number.	CAUSES OF DEATH.	Number of Deaths.	Death Rate Per 100,000.
30	Pott's disease.....	19	.7
31	Cold abscess.....	4	.1
32	White swelling.....	7	.2
33	Other tuberculous affections.....	49	1.8
34	General tuberculosis.....	57	2.1
35	Scrofula.....	17	.6
36	Syphilis.....	58	2.1
36a	Soft chancre.....		
37	Gonorrhea (5 years and over).....		
38	Gonorrhea (under 5 years).....	2	.07
39	Cancer and other tumors of the buccal cavity.....	43	1.6
40	Cancer and other tumors of the stomach and liver.....	519	19.5
41	Cancer and other tumors of the peritoneum, intestines and rectum.....	141	5.3
42	Cancer and other tumors of the female genital organs.....	194	7.3
43	Cancer and other tumors of the breast.....	112	4.2
44	Cancer and other tumors of the skin.....	79	2.9
45	Cancer and other tumors of other organs.....	336	12.6
46	Other tumors.....	52	1.9
47	Acute articular rheumatism.....	138	5.0
48	Chronic rheumatism and gout.....	120	4.5
49	Scurvy.....		
50	Diabetes.....	231	8.7
51	Exophthalmic goitre.....	22	.8
52	Addison's disease.....	8	.3
53	Leukemia.....	32	1.2
54	Anemia, chlorosis.....	88	3.3
55	Other general diseases.....	40	1.5
56	Alcoholism, acute and chronic.....	101	3.8
57	Chronic lead poisoning.....	2	.07
58	Other chronic poisonings (occupational).....	1	.03
59	Other chronic poisonings.....	12	.4
II. LOCAL DISEASES—DISEASES OF THE NERVOUS SYSTEM AND ORGANS OF SPECIAL SENSE.			
60	Encephalitis.....	94	3.5
61	Simple meningitis.....	352	13.2
61a	Epidemic cerebro-spinal meningitis.....	480	17.3
62	Progressive locomotor ataxia.....	51	1.9
63	Other diseases of the spinal cord.....	136	5.1
64	Congestion and hemorrhage of the brain.....	1,351	51.0
65	Softening of the brain.....	110	4.1
66	Paralysis, cause unspecified.....	901	34.0
67	General paralysis.....	102	3.8
68	Other forms of insanity.....	77	2.9
69	Epilepsy.....	144	5.4
70	Convulsions (not puerperal).....	32	1.2
71	Convulsions of infants.....	36	11.5
72	Tetanus.....	71	2.6
73	Chorea.....	10	.3
74	Other nervous diseases.....	139	5.2
75	Diseases of the eye.....	2	.07
76	Diseases of the ear.....	16	.6
III. DISEASES OF THE CIRCULATORY SYSTEM.			
77	Pericarditis.....	42	1.5
78	Acute endocarditis.....	128	4.8
79	Organic heart diseases.....	2,182	82.3
80	Angina pectoris.....	165	6.2
81	Diseases of the arteries, atheroma, aneurism, etc.....	156	5.8

TABLE I—Continued.

Classification Number.	CAUSES OF DEATH.	Number of Deaths.	Death Rate Per 100,000.
82	Embolism and thrombosis	63	2.3
83	Diseases of the veins (varices, hemorrhoids, phlebitis)	7	.2
84	Diseases of the lymphatics, lymphangitis, etc	9	.3
85	Hemorrhage	67	2.5
86	Other diseases of the circulatory system		
IV. DISEASES OF THE RESPIRATORY SYSTEM.			
87	Diseases of the nasal fossae	3	.1
88	Diseases of the larynx	37	1.3
89	Diseases of the thyroid body	4	.1
90	Acute bronchitis	325	12.2
91	Chronic bronchitis	215	8.1
92	Broncho-pneumonia	635	20.2
93	Pneumonia	2,711	102.3
94	Pleurisy	55	2.0
95	Congestion and apoplexy of the lungs	353	13.5
96	Gangrene of the lungs	10	.3
97	Asthma	93	3.5
98	Pulmonary emphysema	15	.5
99	Other diseases of the respiratory system (phthisis excepted)	124	4.6
V. DISEASES OF THE DIGESTIVE SYSTEM.			
100	Diseases of the mouth and adnexa	17	.6
101	Diseases of the pharynx	44	1.6
102	Diseases of the esophagus	5	.1
103	Ulcer of the stomach	59	2.2
104	Other diseases of the stomach (cancer excepted)	619	23.3
105	Diarrhoea and enteritis (under 5 years of age)	1,700	64.1
105a	Chronic diarrhoea	108	4.0
106	Diarrhoea and enteritis (five years and over)	316	11.9
107	Intestinal parasites	2	.07
108	Hernia and intestinal obstructions	3 2	11.4
109	Other diseases of the intestines	128	4.8
110	Acute yellow atrophy of the liver	11	.4
111	Hyatid tumors of the liver		
112	Cirrhosis of the liver	205	7.7
113	Biliary calculi	50	1.8
114	Other diseases of the liver	312	11.7
115	Diseases of the spleen	8	.3
116	Simple peritonitis (not puerperal)	338	12.7
117	Other diseases of the digestive system	3	.1
118	Appendicitis and abscess of the iliac fossae	194	7.3
VI. DISEASES OF THE GENITO-URINARY SYSTEM.			
119	Acute nephritis	189	7.1
120	Bright's disease	1,423	53.7
121	Other diseases of the kidneys and their adnexa	51	1.9
122	Calculi of the urinary tract	6	.2
123	Diseases of the bladder	85	3.2
124	Diseases of the urethra	6	.2
125	Diseases of the prostate	45	1.6
126	Diseases of the male genital organs	1	.03
127	Metritis	3	.1
128	Uterine hemorrhage (non-puerperal)	10	.3
129	Uterine tumor	17	.6
130	Other diseases of the uterus	22	.8
131	Cysts and other ovarian tumors	21	.7
132	Other diseases of the female genital organs	15	.5
133	Non-puerperal diseases of the breast		

TABLE I—Continued.

Classification Number.	CAUSES OF DEATH.	Number of Deaths.	Death Rate Per 100,000.
VII. PUERPERAL DISEASES.			
134	Accidents of pregnancy	46	1.7
135	Puerperal hemorrhage	16	.6
136	Other accidents of labor	21	.7
137	Puerperal septicemia	178	6.7
138	Albuminuria and puerperal eclampsia	37	1.3
139	Phlegmasia alba doleus, puerperal		
140	Other puerperal accidents	23	.8
141	Puerperal diseases of the breast		
VIII. DISEASES OF THE SKIN AND CELLULAR TISSUES.			
142	Gangrene	119	4.4
143	Carbuncle	14	.5
144	Acute abscess, phlegmon	27	1
145	Other diseases of the skin and adnexa	19	.7
IX. DISEASES OF THE LOCOMOTOR SYSTEM.			
146	Affections of the bones	26	.9
147	Arthritis and other diseases of the joints	4	.1
148	Amputation	1	.03
149	Other diseases of the organs of locomotion		
X. MALFORMATIONS.			
150	Malformations	167	6.3
XI. DISEASES OF INFANCY.			
151	Congenital debility, icterus	1,184	44.7
152	Other diseases of early infancy	66	2.4
153	Lack of care	658	24.3
XII. DISEASES OF OLD AGE.			
154	Senile debility	1,296	48.9
XIII. EXTERNAL CAUSES.			
<i>A.—Suicides.</i>			
155	Suicide by poison	140	5.2
156	Asphyxia	4	.1
157	Hanging or strangulation	53	2.0
158	Drowning	14	.5
159	Firearms	94	3.5
160	Cutting instruments	7	.2
161	Jumping from high places	1	.03
162	Crushing		
163	Other suicides	25	.9
<i>B.—Accidents.</i>			
164	Fractures	243	9.1
165	Dislocations	5	.1
166	Other accidental injuries	793	29.9
167	Burns and scalds	179	6.7
168	Burning by corrosive substances		
169	Sunstroke	19	.7
170	Freezing	5	.1
171	Electrical shock	44	1.6
172	Accidental drowning	144	5.4
173	Inanition	167	6.3
174	Inhalation of noxious gases (not suicidal)	23	.8
175	Other acute poisonings	63	2.3
176	Other external violence	110	4.1

TABLE I—Continued.

Classification Number.	CAUSES OF DEATH.	Number of Deaths.	Death Rate Per 100,000.
	<i>C.—Homicides.</i>		
176a	Homicide	84	3.1
176b	Mob violence	1	.03
	XIV. CAUSES ILL-DEFINED.		
177	Dropsy	168	6.3
178	Sudden death (not puerperal)	1	.03
179	Causes not specified or ill-defined	213	8.0
	XV. STILLBIRTHS.		
180	Stillbirths	2,236	84.4
	All causes	36,502	1,378.1

TABLE No. 2.

Deaths from all Causes by Months, Ages, Color, Nationality and Condition, for the Year Ending December 31, 1895. International Classification.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
I. GENERAL DISEASES. EPIDEMIC.												
1. Typhoid fever.....	51	35	34	26	33	48	57	121	203	154	101	65
2. Exanthematous typhus.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
3. Recurrent fever.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4. Intermittent and malarial fever.....	8	3	8	2	7	3	12	17	26	1	6	9
5. Variola or smallpox.....	7	11	3	3	3	4	3	.....	.....	.....	.....	1
6. Measles.....	.....	1	.....	2	.....	1	.....	1	.....	.....	1	.....
7. Scarletina.....	18	11	20	21	11	4	14	6	5	6	11	7
8. Whooping cough.....	10	10	10	15	17	7	18	13	9	12	5	10
9. Croup.....	3	4	3	2	3	.....	1	.....	5	2	7	8
9a. Diphtheria.....	29	27	24	11	10	8	15	15	29	80	34	46
10. Influenza.....	114	221	151	37	15	7	5	.....	4	4	12	21
11. Miliary fever.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12. Asiatic cholera.....	.....	.....	.....	.....	1	2	10	5	7	.....	.....	.....
13. Cholera nostras.....	.....	.....	7	1	4	9	34	61	56	24	11	1
14. Dysentery.....	5	2	.....	4	.....	.....	.....	.....	.....	.....	.....	.....
15. Bubonic plague.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16. Yellow fever.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
17. Leprosy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18. Erysipelas.....	20	14	18	11	11	8	7	3	2	3	6	4
19. Other epidemic diseases.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....
20. Purulent septicemia and infection.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21. Glanders and farcy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
22. Malignant pustule and anthrax.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....
23. Rabies.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	1	.....
24. Actinomycosis, trichinosis, etc.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

25. Pellegria.....	10	3	6	6	2	5	3	1	4	6
26. Tuberculosis of the larynx.....	385	376	415	374	308	303	250	265	283	307
27. Tuberculosis of the lungs.....	12	11	15	15	17	9	12	12	13	13
28. Tuberculosis of the meninges.....	4	14	16	22	20	20	18	32	19	15
29. Abdominal tuberculosis.....										
30. Potts' disease.....	1	3	2	.....	3	1	3	3	1	1
31. Cold abscess.....										
32. White swelling.....	1	.....	.....	1	.....	.....	.....	1	.....	1
33. Other tuberculous affections.....	4	.....	.....	.....	7	6	7	5	4	4
34. General tuberculosis.....	2	.....	5	7	2	10	5	7	3	6
35. Scrofula.....	.....	2	.....	2	2	2	1	2	1	3
36. Syphilis.....	5	6	.....	4	4	5	4	5	7	5
36a. Soft chancre.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
37. Gonorrhea (5 years and over).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
38. Gonorrhea (under 5 years).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
39. Cancer and other tumors of the buccal cavity.....	4	1	5	4	2	3	3	2	6	6
40. Cancer and other tumors of the stomach and liver.....	32	44	49	34	36	46	52	43	39	46
41. Cancer and other tumors of the peritoneum, intestines and rectum.....	6	12	8	11	13	13	16	13	13	9
42. Cancer and other tumors of the female genital organs.....	16	16	14	9	19	18	21	18	24	11
43. Cancer and other tumors of the breast.....	15	5	8	6	16	8	7	8	8	11
44. Cancer and other tumors of the skin.....	8	6	6	10	6	6	8	3	7	9
45. Cancer and other tumors of other organs.....	28	32	27	24	30	41	25	25	34	17
46. Other tumors.....	5	5	4	5	3	2	6	2	5	3
47. Acute articular rheumatism.....	15	4	11	13	11	12	7	6	14	12
48. Chronic rheumatism and gout.....	6	11	12	14	11	4	11	8	9	6
49. Scurvy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
50. Diabetes.....	21	27	24	15	19	11	12	14	23	27
51. Exophthalmic goitre.....	1	1	2	1	2	4	2	.....	3	3
52. Addison's disease.....	2	.....	1	.....	1	1	.....	.....	.....	1
53. Leukemia.....	1	2	5	3	4	3	3	4	2	.....
54. Anemia, chlorosis.....	4	8	4	4	6	10	8	8	1	6
55. Other general diseases.....	2	1	1	3	10	8	6	1	7	3
56. Alcoholism, acute and chronic.....	11	4	9	7	10	9	12	5	9	10
57. Chronic lead poisoning.....	.....	1	.....	.....	.....	.....	1	.....	1	.....
58. Other chronic poisonings (occupational).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
59. Other chronic poisonings.....	1	.....	.....	1	2	1	.....	.....	2	1

TABLE No. 2.—Continued.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
II. DISEASES OF THE NERVOUS SYSTEM AND ORGANS OF SENSE.												
60. Encephalitis.....	6	13	10	4	3	9	8	8	12	9	5	7
61. Simple meningitis.....	48	48	49	38	27	27	43	10	18	14	12	18
61a. Epidemic cerebro-spinal meningitis.....	20	36	42	37	85	10	44	79	51	31	34	41
62. Progressive locomotor ataxia.....	2	3	2	7	2	2	6	5	7	5	3	4
63. Other diseases of the spinal cord.....	16	16	8	7	9	13	15	9	8	13	13	9
64. Congestion and hemorrhage of the brain.....	120	120	112	112	99	113	109	115	102	121	105	123
65. Softening of the brain.....	11	9	7	12	12	6	12	7	8	9	12	5
66. Paralysis, cause unspecified.....	99	100	105	70	52	67	71	70	64	57	69	77
67. General paralysis.....	17	15	4	5	9	4	3	9	10	7	12	7
68. Other forms of insanity.....	10	13	7	6	4	4	8	2	2	6	8	7
69. Epilepsy.....	17	16	9	17	13	11	9	9	11	7	15	10
70. Convulsions (not puerperal).....	6	3	3	3	1	1	2	3	1	2	1	6
71. Convulsions of infants.....	23	39	24	27	26	20	24	25	21	30	19	23
72. Tetanus.....	1	1	1	4	4	8	15	10	8	2	9	6
73. Chorea.....	1	2	2	2	2	12	1	15	13	8	12	5
74. Other nervous diseases.....	14	17	14	7	9	12	13	15	13	8	12	5
75. Diseases of the eye.....	3	4	1	3	1	1	2	2	1	1	2	1
76. Diseases of the ear.....	3	4	1	3	1	1	1	1	1	1	2	1
III. DISEASES OF THE CIRCULATORY SYSTEM.												
77. Pericarditis.....	4	8	4	2	2	4	7	2	3	3	2	8
78. Acute endocarditis.....	10	19	12	11	15	10	7	9	3	6	6	15
79. Organic diseases of the heart.....	233	201	213	196	199	187	164	150	158	164	163	164
80. Angina pectoris.....	18	12	8	16	21	16	8	10	18	9	16	13
81. Diseases of the arteries, atheroma, aneurism, etc.....	18	13	18	9	16	9	7	14	8	13	17	14
82. Embolism and thrombosis.....	7	7	3	5	1	4	8	8	4	3	5	9
83. Diseases of the veins (varices, hemorrhoids, phlebitis).....	1	2	1	1	1	1	2	1	1	1	1	1
84. Diseases of the lymphatics, lymphangitis, etc.....	5	6	12	3	8	7	4	4	4	5	3	6
85. Hemorrhage.....	5	6	12	3	8	7	4	4	4	5	3	6
86. Other diseases of the circulatory system.....												

IV. DISEASES OF THE RESPIRATORY SYSTEM.

87. Diseases of the nasal fossae.....	1	5	1	5	1	3	1	1	1	1	1	3	1	4	1	9
88. Diseases of the larynx.....	48	70	62	28	22	18	12	9	7	5	6	12	13	18	1	9
89. Diseases of the thyroid body.....	17	31	31	28	18	17	17	9	7	8	8	15	17	16	16	16
90. Acute bronchitis.....	85	122	83	46	28	15	15	13	13	5	5	15	24	31	58	58
91. Chronic bronchitis.....	458	633	523	190	140	61	61	46	46	46	46	62	90	192	270	270
92. Broncho pneumonia.....	58	26	50	29	21	14	14	23	23	18	18	11	34	4	6	6
93. Pleurisy.....	58	26	50	29	21	14	14	23	23	18	18	11	34	4	6	6
94. Congestion and apoplexy of the lungs.....	58	26	50	29	21	14	14	23	23	18	18	11	34	4	6	6
95. Gangrene of the lungs.....	1	2	9	2	2	2	2	1	1	1	1	1	7	9	9	9
96. Asthma.....	9	16	9	9	9	8	8	2	2	6	6	6	7	9	9	9
97. Pulmonary emphysema.....	1	1	1	1	1	1	1	1	1	2	2	2	2	3	3	3
98. Other diseases of the respiratory system (phtisic excepted).....	10	9	12	17	6	15	15	7	7	8	8	8	9	10	13	13

V. DISEASES OF THE DIGESTIVE SYSTEM.

100. Diseases of the mouth and adnexa.....	1	2	2	1	1	1	1	1	1	4	4	4	4	2	7	1
101. Diseases of the pharynx.....	6	4	4	2	3	5	5	4	4	2	2	3	1	1	7	5
102. Diseases of the esophagus.....	7	1	6	3	1	6	6	2	2	7	7	2	6	3	4	4
103. Ulcer of the stomach.....	46	41	65	61	51	51	60	40	40	56	56	54	64	52	39	39
104. Other diseases of the stomach (cancer excepted).....	26	30	36	22	35	116	116	359	359	469	469	343	186	54	24	24
105. Diarrhoea and enteritis (under 5 years of age).....	16	1	8	3	9	8	8	13	13	24	24	3	10	4	9	9
106. Diarrhoea and enteritis (5 years and over).....	11	26	27	19	14	25	25	30	30	62	62	23	33	23	18	18
107. Intestinal parasites.....	30	23	41	18	19	32	32	23	23	25	25	26	17	26	17	17
108. Hernia and intestinal obstructions.....	7	5	13	6	7	10	10	13	13	12	12	23	10	11	11	11
109. Other diseases of the intestines.....	3	3	3	1	1	1	1	1	1	1	1	1	1	2	11	11
110. Acute yellow atrophy of the liver.....	13	18	23	16	7	15	15	12	12	24	24	15	22	25	11	11
111. Hydatid tumors of the liver.....	4	6	4	2	3	3	3	4	4	6	6	2	2	8	2	2
112. Cirrhosis of the liver.....	30	19	35	23	23	18	18	24	24	30	30	31	24	23	27	27
113. Biliary calculi.....	31	34	16	29	25	26	26	33	33	30	30	32	30	26	21	21
114. Other diseases of the liver.....	17	18	16	17	15	12	12	12	12	20	20	20	15	15	17	17
115. Diseases of the spleen.....	30	19	35	23	23	18	18	24	24	30	30	31	24	23	27	27
116. Simple peritonitis (not puerperal).....	31	34	16	29	25	26	26	33	33	30	30	32	30	26	21	21
117. Other diseases of the digestive system.....	17	18	16	17	15	12	12	12	12	20	20	20	15	15	17	17
118. Appendicitis and abscess of the iliac fossae.....	17	18	16	17	15	12	12	12	12	20	20	20	15	15	17	17

TABLE No. 2.—Continued.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
VI. DISEASES OF THE GENITO-URINARY SYSTEM.												
119. Acute nephritis.....	18	12	19	13	22	16	14	14	14	13	17	17
120. Bright's disease.....	134	133	137	109	126	118	116	106	106	103	127	106
121. Other diseases of the kidneys and their adnexa.....	8	3	2	4	2	5	8	3	4	.....	8	4
122. Calculi of the urinary tract.....	.....	.....	.....	1	2	.....	1	.....	1	.....	.....	1
123. Diseases of the bladder.....	9	11	7	11	6	4	6	9	6	5	5	6
124. Diseases of the urethra.....	.....	2	1	1	.....	.....	1	.....	1	.....	.....	.....
125. Diseases of the prostate.....	5	1	1	2	8	7	3	2	3	4	3	6
126. Diseases of the male genital organs.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
127. Metritis.....	1	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....
128. Uterine hemorrhage (non-puerperal).....	1	1	2	1	.....	.....	.....	.....	1	.....	3	1
129. Uterine tumor.....	2	1	1	3	1	.....	.....	1	2	2	4	.....
130. Other diseases of the uterus.....	4	1	1	2	6	2	1	1	1	.....	1	2
131. Cysts and other ovarian tumors.....	4	1	3	3	2	1	.....	1	1	3	2	.....
132. Other diseases of the female genital organs.....	.....	3	2	1	2	.....	.....	.....	1	3	1	1
133. Non-puerperal diseases of the breast.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
VII. PUERPERAL DISEASES.												
134. Accidents of pregnancy.....	2	3	5	8	2	2	3	1	8	4	4	4
135. Puerperal hemorrhage.....	2	.....	.....	1	2	.....	1	.....	2	1	2	5
136. Other accidents of labor.....	2	3	1	2	2	10	9	14	13	13	12	21
137. Puerperal septicemia.....	20	7	25	16	18	.....	.....	.....	.....	.....	.....	.....
138. Albuminuria and puerperal eclampsia.....	3	1	.....	3	7	6	4	6	.....	4	1	2
139. Phlegmasia alba dolens, puerperal.....	.....	.....	.....	.....	2	3	2	6	2	1	2	1
140. Other puerperal accidents.....	.....	.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....
141. Puerperal diseases of the breast.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
VIII. DISEASES OF THE SKIN AND CELLULAR TISSUES.												
142. Gangrene.....	3	16	12	11	8	17	10	11	6	10	5	10
143. Carbuncle.....	.....	2	2	2	1	.....	2	.....	2	1	1	1
144. Acute abscess, phlegmon.....	5	7	1	5	1	1	.....	3	2	1	1	.....
145. Other diseases of the skin and adnexa.....	3	4	2	1	.....	.....	.....	2	2	2	3	1

IX. DISEASES OF THE LOCOMOTOR SYSTEM.

146. Affections of the bones.....	2	3	2	2	1	1	4	3	2	4	2	1	1
147. Arthritis and other diseases of the joints.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
148. Amputation.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
149. Other diseases of the organs of locomotion.....

X. MALFORMATIONS.

150. Malformations.....	10	19	11	15	19	14	14	13	11	8	16	17
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XI. DISEASES OF INFANCY.

151. Congenital debility, icterus.....	101	111	118	74	85	93	110	99	114	97	101	8
152. Other diseases of early infancy.....	11	5	4	5	7	6	6	1	5	2	8	6	.....
153. Lack of care.....	52	87	62	37	49	54	60	61	67	47	44	38	.....

XII. DISEASES OF OLD AGE.

154. Senile debility.....	128	140	133	98	122	78	88	94	99	104	103	10
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XIII. EXTERNAL CAUSES.

A.—Suicides.

155. Suicide by poison.....	9	7	13	13	9	7	11	24	11	12	12	12
156. Asphyxia.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
157. Hanging or strangulation.....	2	5	3	6	6	5	7	1	3	8	5	1	.....
158. Drowning.....	1	1	1	1	1	2	2	2	3	2	1	2	.....
159. Firearms.....	10	15	10	9	5	5	8	5	10	9	7	1	.....
160. Cutting instruments.....	.....	1	.....	.....	2	1	.....	.....	.....	1	1	1	.....
161. Jumping from high places.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
162. Crushing.....	.....	1	7	1	.....	1	.....	1	1	4	2	3	.....
163. Other suicides.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

B.—Accidents.

164. Fractures.....	23	14	16	13	14	23	20	30	20	22	28	20	.....
165. Dislocations.....	1	.....	1	.....	.....	1	1	1	.....	.....	.....	1	.....
166. Other accidental injuries.....	64	41	53	67	70	65	68	68	79	77	67	69	.....
167. Burns and scalds.....	20	27	16	11	5	4	12	10	13	14	22	25	.....
168. Burning by corrosive substances.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
169. Sunstroke.....	.....	.....	.....	.....	.....	10	6	3	.....	.....	.....	.....	.....
170. Freezing.....	3	1	.....	.....	.....	8	9	8	2	1	1	1	.....
171. Electrical shock.....	.....	3	5	6	20	23	24	27	16	6	5	5	.....
172. Accidental drowning.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE No. 2.—Continued.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
173. Insanition.....	7	2	3	9	3	15	19	32	34	29	8	8
174. Inhalation of noxious gases (not suicidal).....	1	4	7	8	5	1	2	1	3	2	2	3
175. Other acute poisonings.....	11	14	6	16	5	4	6	6	10	7	3	3
176. Other external violence.....			6			4	12	5	8	4	13	13
<i>C.—Homicides.</i>												
176a. Homicide.....	7		1	2	4	5	11	14	17	8	10	5
176b. Mob violence.....			1									
<i>XIV. CAUSES ILL-DEFINED.</i>												
177. Dropsy.....	16	22	9	13	12	5	16	15	20	11	15	14
178. Sudden death (not puerperal).....	18	33	22	17	8	16	1	31	13	13	8	15
179. Causes not specified or ill-defined.....												
<i>XV. STILLBIRTHS.</i>												
180. Stillbirths.....	202	198	168	197	216	180	181	158	199	178	172	187
Grand total.....	3,479	3,819	3,629	2,766	2,690	2,546	2,932	3,174	3,091	2,801	2,773	2,902

TABLE No. 2—Continued.

Deaths from all Causes, by Months, Ages, Color, Nationality and Condition, for the Year Ending December 31, 1905. International Classification.

	0	1	2	3	4	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.
I. GENERAL DISEASES. EPIDEMIC.																		
1. Typhoid fever.....	11	14	16	11	13	72	125	136	94	64	45	49	46	32	31	30	20	
2. Exanthematous typhus.....								1										
3. Recurrent fever.....																		
4. Intermittent and malarial fever.....	16	5	5	3	2	5	4	3	6	4	5	5	4	3	5	3	10	
5. Variola or smallpox.....	4		1		1	1	1		4	2	3	4	5	3	2			
6. Measles.....	8		1															
7. Scarletina.....	10	18	20	17	14	38	11	1	2				1					
8. Whooping cough.....	96	18	17	4	4	2	2			1							1	
9. Croup.....	10	4	4	4	4	4	10	6	3	1	1							
9a. Diphtheria.....	13	31	41	47	37	110	26											
10. Influenza.....	43	10	6		1	5	4	7	3	9	9	16	14	17	32	40	47	
11. Miliary fever.....																		
12. Asiatic cholera.....																		
13. Cholera nostras.....						1	1						1	4	2	3	1	
14. Dysentery.....						6	1	2	3	2	9	3	4	9	16	23	18	
15. Bubonic plague.....																		
16. Yellow fever.....								1										
17. Leprosy.....																		
18. Erysipelas.....	37	1	2			2	1	2	1	2	1	5	5	1	2	7	4	
19. Other epidemic diseases.....	1																	
20. Purulent septicaemia and infection.....	32	5	1	2	2	9	13	8	16	27	18	10	12	17	10	20	22	
21. Glanders and farcy.....																		
22. Malignant pustule and anthrax.....																		
23. Rabies.....						2								1		1		
24. Actinomycosis, trichinosis, etc.....																		

TABLE No. 2.—Continued.

	0	1	2	3	4	5	10 15.	15 20.	20 25.	25 30.	30 35.	35 40.	40 45.	45 50.	50 55.	55 60.	60 65.	65 70.
35. Pellegra.....	3	37	13	10	3	1	1	7	8	4	6	7	3	2	5	3	2	2
36. Tuberculosis of the larynx.....	50	37	13	10	3	36	74	404	642	534	431	378	251	217	195	134	148	162
37. Tuberculosis of the lungs.....	32	35	10	6	6	16	9	8	8	6	6	4	1	4	1	1	1	7
38. Tuberculosis of the meninges.....	16	10	1	1	1	5	6	15	21	18	12	27	11	14	13	10	11	7
39. Abdominal tuberculosis.....	4	...	...	...	...	3	2	2	1	3	1	...	2	...	...	...	1	...
40. Pott's disease.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
41. Cold abscess.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
42. White swelling.....	1	...	1	1	1	1	1	5	5	5	4	4	1	6	1	2	1	...
43. Other tuberculous affections.....	2	3	1	1	1	1	2	7	10	4	5	3	4	2	3	2	1	3
44. General tuberculosis.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
45. Scrofula.....	5	1	...	1	...	2	1	1	1	1	1	2	3	1	1	2	2	2
46. Syphilis.....	27	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
47. Soft chancre.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
48. Gonorrhoea (3 years and over).....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
49. Gonorrhoea (under 3 years).....	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
50. Cancer and other tumors of the buccal cavity.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
51. Cancer and other tumors of the stomach and liver.....	1	1	...	...	...	...	...	1	...	1	5	13	22	33	50	60	79	79
52. Cancer and other tumors of the peritoneum, intestines and rectum.....	...	...	...	1	...	...	1	1	...	5	1	5	15	10	14	13	24	19
53. Cancer and other tumors of the female genital organs.....	...	...	1	...	...	...	...	...	1	3	10	13	21	32	28	30	16	16
54. Cancer and other tumors of the breast.....	...	...	...	...	...	...	...	...	...	...	2	3	10	13	11	17	15	12
55. Cancer and other tumors of the skin.....	...	...	...	1	...	...	...	...	...	...	1	1	...	4	7	2	13	5
56. Cancer and other tumors of other organs.....	...	...	1	4	3	1	1	3	6	2	9	9	15	26	38	28	39	59
57. Other tumors.....	1	...	...	...	2	2	1	1	1	2	2	2	8	7	5	3	6	6
58. Acute articular rheumatism.....	...	...	1	...	1	9	14	10	6	5	5	10	8	4	8	9	10	10
59. Chronic rheumatism and gout.....	...	...	...	...	...	4	3	1	5	...	...	2	5	1	7	16	20	15
60. Scrofula.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
61. Diabetes.....	2	...	1	...	2	9	12	11	9	11	5	7	10	13	18	18	22	32
62. Exophthalmic goitre.....	...	...	1	1	...	...	...	1	1	1	5	5	...	4	3	5	...	1

TABLE No. 2.—Continued.

	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60	65
82. Embolism and thrombosis.....								2	2	6	3	4	3	5	10	7	5	6
83. Diseases of the veins (varices, hemorrhoids, phlebitis).....												2			1			1
84. Diseases of the lymphatics, lymphangitis, etc.....	1					2	3	1	3	1	1	5	2	3	2	1	1	3
85. Hemorrhage.....	13	2	2	1		2				7							4	
86. Other diseases of the circulatory system.....																		
IV. DISEASES OF THE RESPIRATORY SYSTEM.																		
87. Diseases of the nasal fossae.....	2		4	4	2	7		3	2	1		1	1	1			1	1
88. Diseases of the larynx.....	10		12	5	1	2	1	1	1	1	3	2	3	2	2	3	7	12
89. Diseases of the thyroid body.....	168	27	5	4				2				2	3	4	6	10	19	27
90. Acute bronchitis.....	1																	
91. Chronic bronchitis.....																		
92. Broncho pneumonia.....	233	73	25	12	5	13	2	3	5	3	3	4	5	3	5	11	9	29
93. Pneumonia.....	562	164	64	47	21	71	61	80	75	67	79	96	86	94	114	145	178	
94. Pleurisy.....	1	1	1	1	1	1	1	6	6	1	1	1	4	4	4	8	1	3
95. Congestion and apoplexy of the lungs.....	83	14	8	4	2	6	8		3	9	9	7	7	9	11	15	19	30
96. Gangrene of the lungs.....									2	1	2	2	2	1	1	1	2	2
97. Asthma.....	1	1	1						3	1		1	1		4	7	11	7
98. Pulmonary emphysema.....		1															3	8
99. Other diseases of the respiratory system (phthisis excepted).....	7	2			1	2	2	6	6	11	7	3	5	5	11	8	10	17
V. DISEASES OF THE DIGESTIVE SYSTEM.																		
100. Diseases of the mouth and adnexa.....	13	2							1				1				1	
101. Diseases of the pharynx.....	11	1	1	1	2	10	2	1			1			2	3			2
102. Diseases of the esophagus.....																		
103. Ulcer of the stomach.....							1		5	2	6	5	5	6	6	5	5	3
104. Other diseases of the stomach (cancer excepted).....	125	20	10	6	3	12	6	6	14	8	16	22	22	24	25	30	40	45
105. Diarrhoea and enteritis (under 5 years of age).....	1,115	406	130	36	13													
105a. Chronic Diarrhoea.....											1	2	1			9	19	20

106. Diarrhoea and enteritis (5 yrs. and over).....	43	1	8	2	1	22	9	5	14	14	7	11	15	8	10	24	27	29
107. Intestinal parasites.....	29	6	2	3	2	5	6	15	7	12	8	8	10	16	20	18	23	15
108. Hernia and intestinal obstructions.....																		
Other diseases of the intestines.....																		
109. Acute yellow atrophy of the liver.....																		
110. Hydatid tumors of the liver.....																		
111. Cirrhosis of the liver.....																		
112. Carcinoma of the liver.....																		
113. Biliary calculi.....																		
114. Other diseases of the liver.....	22	3	2	1	2	2	2	4	6	1	8	12	15	23	25	30	41	36
115. Diseases of the spleen.....																		
116. Simple peritonitis (not puerperal).....																		
117. Other diseases of the digestive system.....	18	2	5	3	1	11	24	30	34	31	33	37	23	16	12	8	17	16
118. Appendicitis and abscess of the iliac fossae.....	2		1	2	1	14	34	26	24	20	8	13	5	9	3	12	3	6
VI. DISEASES OF THE GENITO-URINARY SYSTEM.																		
120. Acute nephritis.....	8	9	4	3	1	7	2	8	7	9	11	7	10	9	14	9	10	12
121. Bright's disease.....	18	8	5	4	5	7	13	19	25	29	40	62	73	71	114	111	162	162
122. Other diseases of the kidneys and their adnexa.....	3																	
123. Calculi of the urinary tract.....	4			1		2		2	1		2		1	4		2	6	5
124. Diseases of the bladder.....												3	1	1		4	10	5
125. Diseases of the urethra.....																		
126. Diseases of the prostate.....																		
127. Diseases of the male genital organs.....																		
128. Metritis.....																		
129. Uterine hemorrhage (non-puerperal).....																		
130. Uterine tumor.....																		
131. Other diseases of the uterus.....																		
132. Cervix and other vaginal tumors.....																		
133. Other diseases of the female genital organs.....																		
134. Non-puerperal diseases of the breast.....																		
VII. PUERPERAL DISEASES.																		
135. Accidents of pregnancy.....																		
136. Puerperal hemorrhage.....																		
137. Other accidents of labor.....																		
138. Puerperal septicaemia.....																		

TABLE No. 2.—Continued.

	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60	65
							to	to	to	to	to	to	to	to	to	to	to	to
							10.	15.	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.
82. Embolism and thrombosis.....																		
83. Diseases of the veins (varices, hemorrhoids, phlebitis).....																		
84. Diseases of the lymphatics, lymphangitis, etc.....	1					2	2	3	1	3	7	5	2	3	2	2	4	3
85. Hemorrhage.....	13	2	2	1														
86. Other diseases of the circulatory system.....																		
IV. DISEASES OF THE RESPIRATORY SYSTEM.																		
87. Diseases of the nasal fossae.....	2		4	4	2	7												1
88. Diseases of the larynx.....	10																	
89. Diseases of the thyroid body.....			12	5	1	2	1	1	1	1	2	2	5	2	2	3	7	12
90. Acute bronchitis.....	168	27	4															27
91. Chronic bronchitis.....	1	5	4															
92. Broncho pneumonia.....	233	73	25	12	5	13	2	3	5	3	3	4	5	3	5	11	9	29
93. Pneumonia.....	582	164	64	47	21	71	61	80	75	67	78	96	88	94	114	114	145	178
94. Pleurisy.....	1	1	1	1	1	1	1	1	1	1	1	1	1	4	2	8	1	3
95. Congestion and apoplexy of the lungs.....	83	14	8	4	2	6	8	6	3	9	9	7	7	9	11	15	19	30
96. Gangrene of the lungs.....																		
97. Asthma.....	1	1	1						2	3	1	2	2	1	1	4	7	2
98. Pulmonary emphysema.....																	11	7
99. Other diseases of the respiratory system (pathistic excepted).....	7	2			1	2	2	6	6	11	7	3	5	5	11	8	10	17
V. DISEASES OF THE DIGESTIVE SYSTEM.																		
100. Diseases of the mouth and adnexa.....	13	2							1									
101. Diseases of the pharynx.....	11	1	1	1	2	10	2	1									1	2
102. Diseases of the esophagus.....																		
103. Ulcer of the stomach.....									5	2	6	5	5	6	6	5	5	3
104. Other diseases of the stomach (cancer excepted).....	125	20	10	6	3	12	6	6	14	8	16	22	22	24	25	30	40	45
105. Diarrhoea and enteritis (under 5 years of age).....	1,115	406	130	36	13													
105a. Chronic Diarrhoea.....																		

105. Diarrhoea and enteritis (5 yrs. and over).....	1	1	22	9	5	14	14	7	11	15	8	10	24	27				
106. Intestinal parasites.....	43	9	8	2	5	1	1	1	1	1	1	1	1	1				
107. Hernia and intestinal obstructions.....	29	6	2	3	2	5	1	3	3	2	2	2	10	9				
108. Other diseases of the intestines.....	110.	Acute yellow atrophy of the liver.....	111.	Hydrated tumors of the liver.....	112.	Cirrhosis of the liver.....	113.	Biliary calculi.....	114.	Other diseases of the liver.....	115.	Diseases of the spleen.....	116.	Simple peritonitis (not puerperal).....	117.	Other diseases of the digestive system.....	118.	Appendicitis and abscess of the iliac fossae.....
120.	8	9	4	3	1	7	2	8	7	9	10	9	14	9	10	12		
121.	18	8	5	4	5	7	13	19	25	29	40	62	73	71	114	131	162	
122.	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
123.	4	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
124.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
125.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
126.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
127.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
128.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
129.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
130.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
131.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
132.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
133.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
VII. PUERPERAL DISEASES.																		
134.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
135.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
136.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
137.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

VI. DISEASES OF THE GENITO-URINARY SYSTEM.

TABLE No. 2.—Continued.

	0	1	2	3	4	5	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.
VIII. DISEASES OF THE SKIN AND CELLULAR TISSUES.																		
138. Albuminuria and puerperal eclampsia							8	11	6	8	2	1	1					
139. Phlebotomia alba dolens, puerperal								6		4	5	2						
140. Other puerperal accidents																		
141. Puerperal diseases of the breast																		
IX. DISEASES OF THE SKIN AND CELLULAR TISSUES.																		
142. Gangrene	2	1																
143. Carbuncle	2																	
144. Acute abscess, phlegmon	11				1	1			1		1	2	3	4	5	8	3	20
145. Other diseases of the skin and adnexa	7							1			2			2	3			3
IX. DISEASES OF THE LOCOMOTOR SYSTEM.																		
146. Affections of the bones	4	1	2	4	1	2	1	1				1		1			1	4
147. Arthritis and other diseases of the joints																		
148. Amputation																		
149. Other diseases of the organs of locomotion																		
X. MALFORMATIONS.																		
150. Malformations	163	1	1	1		1												
XI. DISEASES OF INFANCY.																		
151. Congenital debility, icterus	1,184																	
152. Other diseases of early infancy	66																	
153. Lack of care	653																	
XII. DISEASES OF OLD AGE.																		
154. Senile debility															1		5	30

TABLE No. 2—Continued.

Deaths from all Causes, by Months, Ages, Color, Nationality and Condition, for the Year Ending December 31, 1905. International Classification.

	70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	Not Reported.	Single.	Married.	Widowed.	Not Reported.	Total.
I. GENERAL DISEASES. EPIDEMIC.															
1. Typhoid fever.....	19	9	8	.....	4	898	30	871	54	3	490	381	58	9	928
2. Exanthematous typhus.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	.....	1
3. Recurrent fever.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
4. Intermitent and malarial fever.....	5	8	5	.....	1	110	6	108	7	1	49	51	16	.....	116
5. Variola or smallpox.....	1	.....	.....	.....	3	35	.....	32	.....	3	14	21	.....	.....	35
6. Measles.....	.....	.....	.....	.....	1	6	.....	6	.....	.....	4	2	.....	.....	6
7. Scarlatina.....	.....	.....	.....	.....	.....	133	.....	132	1	.....	131	.....	.....	.....	133
8. Whooping cough.....	.....	.....	.....	.....	.....	127	9	136	.....	.....	134	2	.....	.....	136
9. Croup.....	.....	.....	.....	.....	.....	37	.....	38	.....	.....	37	2	.....	.....	38
9a. Diphtheria.....	.....	.....	.....	.....	.....	319	9	326	2	.....	321	7	.....	.....	328
10. Influenza.....	67	86	132	23	4	570	21	498	87	6	119	231	232	9	591
11. Miliary fever.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12. Asiatic cholera.....	.....	.....	.....	.....	.....	24	2	20	6	.....	3	11	12	.....	26
13. Cholera nostras.....	3	3	6	.....	.....	215	3	168	44	6	31	89	93	5	218
14. Dysentery.....	31	36	44	7	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15. Bubonic plague.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16. Yellow fever.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	1	.....	.....	.....	1
17. Leprosy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18. Erysipelas.....	10	10	9	2	1	107	.....	95	9	3	56	23	21	2	107
19. Other epidemic diseases.....	.....	.....	.....	.....	.....	2	.....	2	.....	.....	2	.....	.....	.....	2
20. Purulent septicemia and infection.....	21	14	11	1	1	274	11	256	26	3	96	146	40	3	285
21. Glanders and farcy.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
22. Malignant pustule and anthrax.....	.....	.....	.....	.....	.....	2	.....	2	.....	.....	.....	.....	.....	.....	2
23. Rabies.....	.....	.....	.....	.....	.....	3	.....	3	.....	.....	2	1	.....	.....	3
24. Actinomycosis, trichinosis, etc.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

25. Pellegri.....	111	66	28	1	1	55	3	54	3	1	24	26	5	3	58
26. Tuberculosis of the larynx.....	4	4	1	26	3,683	257	257	3,684	229	27	1,460	2,003	440	37	3,940
27. Tuberculosis of the lungs.....	2	4	1	2	141	10	10	151	8	2	131	16	4	4	151
28. Tuberculosis of the meninges.....	2	4	1	2	190	17	17	197	1	2	104	79	20	4	207
29. Abdominal tuberculosis.....															
30. Pott's disease.....			1		16	3	3	18	1		14	3	2		19
31. Cold abscess.....			1		4			4			1	1	2		4
32. White swelling.....	2		1		7			6	1		4	3	2		7
33. Other tuberculous affections.....	1	2	2		43	6	6	46	3	1	23	21	5		49
34. General tuberculosis.....	2		1		52	5	5	56			27	22	8		57
35. Scrofula.....		1			14	3	3	17			14	2		1	17
36. Syphilis.....	1	2			53	5	5	52	3	3	40	12	4	2	58
36a. Soft chancre.....															
37. Gonorrhea (5 years or over).....															
38. Gonorrhea (under 5 years).....					2			2			2				2
39. Cancer and other tumors of the buccal cavity.....	9	3	4	1	43			30	12	1	4	22	17		43
40. Cancer and other tumors of the stomach and liver.....	77	51	32	2	512	7	7	391	125	3	44	304	164	7	519
41. Cancer and other tumors of the peritoneum, intestines and rectum.....	18	10	3	1	139	2	2	110	26	5	12	97	30	2	141
42. Cancer and other tumors of the female genital organs.....	13	5	4	1	186	8	8	175	17	2	12	129	51	2	194
43. Cancer and other tumors of the breast.....	14	7	8		110	2	2	100	11	1	10	67	32	3	112
44. Cancer and other tumors of the skin.....	8	20	15	2	76	1	1	69	9	1	5	43	30	1	79
45. Cancer and other tumors of other organs.....	37	32	15	2	323	8	8	282	46	8	40	198	96	2	386
46. Other tumors.....	4	3	2		50	2	2	46	6		6	33	13		52
47. Acute articular rheumatism.....	7	10	6	1	127	6	6	128	5		45	64	23	1	133
48. Chronic rheumatism and gout.....	21	10	10		115	5	5	103	17		18	77	21	4	120
49. Scurvy.....															
50. Diabetes.....	23	16	7	3	223	3	3	204	27		57	127	47		231
51. Exophthalmic goitre.....					21	1	1	22			4	13	5		22
52. Addison's disease.....		1			8			7	1		1	6	1		8
53. Leukemia.....		2			31	1	1	31	1		13	15	4		32
54. Anemia, chlorosis.....	4	11	4		88			27	11		27	45	15	1	88
55. Other general diseases.....	2	2	1		39	1	1	36	4		24	15	1		40
56. Alcoholism, acute and chronic.....	3	1		1	97	4	4	85	12	4	35	38	16	12	101
57. Chronic lead poisoning.....					2			2				2			2
58. Other chronic poisonings (occupational).....					1			1				1			1
59. Other chronic poisonings.....	2		1		12			12			2	6	4		12

TABLE No. 2.—Continued.

	70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	Not Reported.	Single.	Married.	Widowed.	Not Reported.	Total.
II. DISEASES OF THE NERVOUS SYSTEM AND ORGANS OF SENSE.															
60. Encephalitis.....	2	1	2	.....	.....	89	5	88	5	1	67	17	9	1	94
61. Simple meningitis.....	4	3	1	.....	2	338	14	340	11	1	270	61	16	5	352
61a. Epidemic cerebro-spinal meningitis.....	3	3	1	1	1	447	13	455	4	1	401	44	12	1	480
62. Progressive locomotor ataxia.....	8	2	.....	.....	.....	50	1	44	6	1	6	30	14	.....	51
63. Other diseases of the spinal cord.....	9	13	6	1	.....	134	2	114	18	4	47	62	24	3	136
64. Congestion and hemorrhage of the brain.....	190	166	162	17	9	1,312	39	1,131	200	18	233	659	431	28	1,351
65. Softening of the brain.....	19	23	17	1	.....	109	1	93	15	2	7	64	37	2	110
66. Paralysis, cause unspecified.....	145	145	151	20	5	874	27	740	147	14	90	417	347	17	901
67. General paralysis.....	14	12	5	.....	2	100	2	85	13	4	14	58	24	6	102
68. Other forms of insanity.....	7	1	1	.....	1	71	6	69	7	1	16	48	12	1	77
69. Epilepsy.....	4	6	1	.....	4	138	6	133	7	4	86	34	20	4	144
70. Convulsions (not puerperal).....	2	.....	.....	.....	.....	30	2	28	5	1	14	14	3	1	32
71. Convulsions of infants.....	.....	.....	.....	.....	.....	234	12	306	6	.....	363	.....	.....	.....	306
72. Tetanus.....	1	.....	.....	.....	.....	70	1	65	.....	.....	50	18	2	1	71
73. Chorea.....	8	9	1	.....	1	136	3	118	20	1	61	56	23	3	139
74. Other nervous diseases.....	.....	.....	1	.....	.....	2	.....	2	1	.....	14	.....	.....	.....	2
75. Diseases of the eye.....	.....	.....	1	.....	.....	16	.....	13	.....	.....	.....	1	.....	.....	16
76. Diseases of the ear.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
III. DISEASES OF THE CIRCULATORY SYSTEM.															
77. Pericarditis.....	4	2	2	.....	.....	38	4	34	8	.....	8	20	14	.....	42
78. Acute endocarditis.....	9	15	15	.....	.....	121	7	104	20	2	33	59	35	1	128
79. Organic diseases of the heart.....	313	288	202	17	14	2,102	80	1,808	346	23	317	1,119	713	33	2,182
80. Angina pectoris.....	23	18	14	1	3	160	5	140	24	1	12	103	48	2	165
81. Diseases of the arteries, aneurism, etc.....	21	30	30	4	1	149	7	121	31	4	13	72	67	4	156
82. Embolism and thrombosis.....	5	3	2	.....	.....	59	4	55	8	.....	8	42	13	.....	63
83. Diseases of the veins (varices, hemorrhoids, phlebitis).....	1	1	2	.....	.....	7	.....	6	1	.....	.....	3	4	.....	7

84. Diseases of the lymphatics, lymphangitis, etc.
 85. Hemorrhage.....
 86. Other diseases of the circulatory system.....

9
67

IV. DISEASES OF THE CIRCULATORY SYSTEM.

87. Diseases of the nasal fossae.....
 88. Diseases of the larynx.....
 89. Diseases of the thyroid body.....
 90. Acute bronchitis.....
 91. Chronic bronchitis.....
 92. Broncho pneumonia.....
 93. Pneumonia.....
 94. Pleurisy.....
 95. Congestion and apoplexy of the lungs.....
 96. Gangrene of the lungs.....
 97. Asthma.....
 98. Pulmonary emphysema.....
 99. Other diseases of the respiratory system (phthisic excepted).....

3
37
3
325
215
535
2,711
55
358
10
83
15
124

V. DISEASES OF THE DIGESTIVE SYSTEM.

100. Diseases of the mouth and adnexa.....
 101. Diseases of the pharynx.....
 102. Diseases of the esophagus.....
 103. Ulcer of the stomach.....
 104. Other diseases of the stomach (cancer excepted)
 105. Diarrhoea and enteritis (under 5 years of age).
 106a. Chronic diarrhoea.....
 106. Diarrhoea and enteritis (5 years and over).....
 107. Intestinal parasites.....
 108. Hernia and intestinal obstructions.....
 109. Other diseases of the intestines.....
 110. Acute yellow atrophy of the liver.....
 111. Hydatid tumors of the liver.....
 112. Cirrhosis of the liver.....
 113. Biliary calculi.....
 114. Other diseases of the liver.....
 115. Diseases of the spleen.....
 116. Simple peritonitis (not puerperal).....
 117. Other diseases of the digestive system.....
 118. Appendicitis and abscess of the iliac fossae.....

17
44
5
59
619
1,700
108
316
2
302
128
11
205
50
312
8
338
3
194

TABLE No. 2.—Continued.

	70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	Not Reported.	Single.	Married.	Widowed.	Not Reported.	Total.
II. DISEASES OF THE NERVOUS SYSTEM AND ORGANS OF SENSE.															
60. Encephalitis.....	2	1	2	.....	2	89	5	88	5	1	67	17	9	1	94
61. Simple meningitis.....	4	.....	1	.....	.....	388	14	340	11	1	270	61	16	5	393
61a. Epidemic cerebro-spinal meningitis.....	3	3	1	1	1	447	13	455	4	1	401	44	12	.....	490
62. Progressive locomotor ataxia.....	8	2	.....	.....	.....	50	44	45	6	1	6	80	14	1	61
63. Other diseases of the spinal cord.....	9	13	6	1	.....	134	2	114	18	4	47	62	24	3	136
64. Congestion and hemorrhage of the brain.....	190	166	162	17	9	1,312	39	1,131	200	18	233	659	431	28	1,351
65. Softening of the brain.....	19	23	17	1	.....	109	1	93	15	2	7	61	37	3	110
66. Paralysis, cause unspecified.....	145	145	151	20	5	874	27	740	147	14	90	417	347	17	901
67. General paralysis.....	14	12	5	.....	2	100	2	85	13	4	14	58	24	6	102
68. Other forms of insanity.....	7	1	1	.....	1	71	6	69	7	1	16	48	12	1	77
69. Epilepsy.....	4	6	1	.....	4	138	6	133	7	4	86	34	20	4	144
70. Convulsions (not puerperal).....	2	.....	.....	.....	.....	30	2	28	6	1	14	14	3	1	33
71. Convulsions of infants.....	.....	.....	.....	.....	.....	244	12	306	.....	.....	304	.....	.....	.....	306
72. Tetanus.....	1	.....	.....	.....	.....	70	1	65	6	.....	50	16	2	1	71
73. Chorea.....	.....	.....	.....	.....	1	10	.....	10	.....	.....	8	2	.....	.....	10
74. Other nervous diseases.....	8	9	1	.....	1	136	3	118	20	1	61	66	29	8	139
75. Diseases of the eye.....	.....	.....	1	.....	2	2	.....	2	.....	2	2	.....	.....	.....	2
76. Diseases of the ear.....	.....	.....	1	.....	.....	16	.....	13	1	.....	14	1	.....	.....	16
III. DISEASES OF THE CIRCULATORY SYSTEM.															
77. Pericarditis.....	4	2	2	.....	.....	38	4	34	8	.....	8	30	14	.....	42
78. Acute endocarditis.....	9	15	15	.....	.....	121	7	104	20	2	33	69	35	.....	126
79. Organic diseases of the heart.....	313	298	202	17	14	2,102	80	1,808	346	28	317	1,119	713	83	2,152
80. Angina pectoris.....	23	18	14	1	3	160	5	140	24	1	12	103	48	2	165
81. Diseases of the arteries, aneurism, etc.....	21	30	30	4	1	149	7	121	31	4	13	72	67	4	166
82. Embolism and thrombosis.....	.....	.....	.....	.....	.....	59	4	55	8	.....	8	42	13	.....	63
83. Diseases of the veins (varices, hemorrhoids, phlebitis).....	5	3	2	.....	.....	7	.....	6	1	.....	.....	3	.....	.....	7

TABLE No. 2.—Continued.

	70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	Not Reported.	Single.	Married.	Widowed.	Not Reported.	Total.
VI. DISEASES OF THE GENITO-URINARY SYSTEM.															
119. Acute nephritis.....	21	17	10		1	183	6	164	24	1	56	87	44	2	189
120. Brights disease.....	178	175	121	15	6	1,368	55	1,108	235	20	196	895	391	23	1,423
121. Other diseases of the kidneys and their adnexa.....	6	5	10		1	48	3	42	9		11	22	18		51
122. Calculi of the urinary tract.....	1					4		4	2		1	4	4	1	6
123. Diseases of the bladder.....	18	22	20	1		83	3	64	21		7	46	32		85
124. Diseases of the urethra.....			1			6		6			1	4	1		6
125. Diseases of the prostate.....	7	18	5	1		41	4	35	9	1	3	29	11	2	45
126. Diseases of the male genital organs.....		1				1			1			1			1
127. Metritis.....						3		3				3			3
128. Uterine hemorrhage (non-puerperal).....						10		10			3	7			10
129. Uterine tumor.....						16	1	15	1	1	2	12	3		17
130. Other diseases of the uterus.....					2	18	4	22	3		5	15	6		21
131. Cysts and other ovarian tumors.....		1				19	2	18	3		2	13	2		22
132. Other diseases of the female genital organs.....	1		1			14	1	15			1	11	2	1	15
133. Non-puerperal diseases of the breast.....															
VII. PUERPERAL DISEASES.															
134. Accidents of pregnancy.....						43	3	45	1		4	41	1		46
135. Puerperal hemorrhage.....						16		15	1			16			16
136. Other accidents of labor.....						21		20	1			21			21
137. Puerperal septicaemia.....					1	174	4	167	10	1	8	167	2	1	178
138. Albuminuria and puerperal eclampsia.....						85	2	37			2	35			37
139. Phlegmasia alba dolens, puerperal.....						22	1	23				22	1		23
140. Other puerperal accidents.....															
141. Puerperal diseases of the breast.....															
VII. DISEASES OF THE SKIN AND CELLULAR TISSUES.															
142. Gangrene.....	18	20	23	9	1	117	2	93	25	1	16	56	46	1	119
143. Carbuncle.....		1				14		14				4	2	1	14
144. Acute abscess, phlegmon.....	2	1	1		1	24	3	22	1		16	7	4		27
145. Other diseases of the skin and adnexa.....	1	1	1	1		19		16	3		10	7	2		19

IX. DISEASES OF THE LOCOMOTOR SYSTEM.

146. Affections of the bones.....	1	3	25	1	25	1	19	5	2	26
147. Arthritis and other diseases of the joints.....	2	1	4	1	4	1	1	3	1	4
148. Amputation.....	1	1	1	1	1	1	1	1	1	1
149. Other diseases of the organs of locomotion.....										

X. MALFORMATIONS.

150. Malformations			165	2	167		167			167
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XI. DISEASES OF INFANCY.

151. Congenital debility, icterus.....			1,161	23	1,184		1,184			1,184
152. Other diseases of early infancy.....			62	4	66		66			66
153. Lack of care.....			620	38	658		658			658

XII. DISEASES OF OLD AGE.

154. Senile debility	159	282	652	166	1	1,257	39	960	317	19	74	327	868	27	1,286
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XIII. EXTERNAL CAUSES.

A.—Suicides.

155. Suicide by poison.....	3	2			1	138	2	121	13	6	38	79	20	3	140
156. Asphyxia.....						4	4	4			1	1	1	1	4
157. Hanging or strangulation.....	6	1	4	1		53		42	11		10	29	13	1	53
158. Drowning.....						13	1	7	5	2	3	5	4	2	14
159. Firearms.....	4	3	2			93	1	84	10		27	54	11	2	94
160. Cutting instruments.....						7		7			2	4	1		7
161. Jumping from high places.....						1			1		1				1
162. Crushing.....															
163. Other suicides.....	1	1				25		24	1		6	13	6		25

B.—Accidents.

164. Fractures.....	11	20	38	11	6	287	6	184	46	13	66	97	68	12	243
165. Dislocations.....		2				5		4	1			4			5
166. Other accidental injuries.....	23	27	20	7	18	767	26	670	96	27	331	326	96	38	798
167. Burns and scalds.....	9	5	3	1		172	7	165	14		109	50	18	2	179
168. Burning by corrosive substances.....															
169. Sunstroke.....		1	1			18	1	15	3	1	4	10	4	1	19
170. Freezing.....	1	1				5		4			1	1	2	1	5
171. Electrical shock.....			1			44		42	2		28	14	1		44
172. Accidental drowning.....		3	2		3	134	10	126	10	8	106	23	4	11	144

TABLE No. 2.—Continued.

	70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	Not Reported.	Single.	Married.	Widowed.	Not Reported.	Total.
173. Inanition	3	3	6	.....	.....	156	11	158	9	.....	143	6	18	.....	167
174. Inhalation of noxious gases (not suicidal)	1	1	2	.....	.....	22	1	18	4	1	12	9	2	.....	23
175. Other acute poisonings.	1	1	1	.....	1	62	1	58	5	.....	35	17	11	.....	63
176. Other external violence	1	2	3	.....	.....	107	3	108	.....	2	87	13	8	2	110
<i>C.—Homicides.</i>															
176a. Homicide	1	1	.....	.....	4	70	14	73	8	3	36	33	8	7	84
176b. Mob violence .....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	1	.....	.....	.....	1
<i>XIV. CAUSES ILL-DEFINED.</i>															
177. Dropsy	14	16	16	1	1	157	11	133	34	1	24	93	49	2	168
178. Sudden death (not puerperal) .....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	1
179. Causes not specified or ill-defined	6	2	8	1	4	201	12	172	31	10	101	57	43	12	213
<i>XV. STILLBIRTHS.</i>															
180. Stillbirths .....	.....	.....	.....	.....	.....	2,147	89	2,236	.....	.....	2,236	.....	.....	.....	2,236
Grand total	2,409	2,299	2,476	385	185	35,096	1,406	32,614	3,532	356	16,423	12,883	6,730	461	96,502

TABLE 2A.

Recapitulation of Table No. 2.—Classified Deaths by Months, Ages, Color, Nationality and Conjugal Condition, Year 1905.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
I. General Diseases.—Epidemic.....	896	974	957	755	746	680	761	828	882	819	771	723
II. Diseases of the nervous system an organs of sense.....	419	457	400	361	308	313	384	374	336	322	331	349
III. Diseases of the circulatory system.....	296	268	271	242	265	2 8	200	198	203	204	214	230
IV. Diseases of the respiratory system.....	702	917	790	354	249	145	1 3	162	131	203	318	460
V. Diseases of the digestive system.....	219	235	301	230	222	340	572	776	595	413	281	207
VI. Diseases of the genito-urinary system.....	186	169	176	151	177	154	151	139	141	133	171	146
VII. Puerperal diseases.....	29	14	33	82	33	22	21	29	27	24	24	33
VIII. Diseases of the skin and cellular tissues.....	11	29	17	19	10	18	12	16	12	14	9	12
IX. Diseases of the locomotor system.....	3	4	2	3	1	4	3	2	5	14	.....	1
X. Malformations.....	10	19	11	15	19	14	14	13	11	8	8	17
XI. Diseases of infancy.....	164	203	181	116	141	153	176	161	186	146	153	125
XII. Diseases of old age.....	128	140	133	98	122	78	83	94	99	101	103	109
XIII. External causes.....	160	137	155	163	161	188	220	238	231	266	187	174
XIV. Causes ill-defined.....	34	55	31	80	20	21	36	46	31	24	23	29
XV. Stillbirths.....	202	198	168	197	216	180	181	158	199	178	172	187
All causes.....	3,479	3,819	3,629	2,766	2,690	2,546	2,932	3,174	3,091	2,891	2,773	2,802

TABLE 2A.—Continued.

	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60	65
I. General Diseases.—Epidemic.....	444	202	145	114	103	355	268	649	933	761	628	602	510	517	527	483	562	570
II. Diseases of the nervous system and organs of sense.....	680	212	88	57	35	93	81	60	79	77	97	123	135	181	178	264	311	391
III. Diseases of the circulatory system.....	60	8	6	5	6	30	35	38	44	53	72	106	90	131	168	213	307	394
IV. Diseases of the respiratory system.....	1,088	288	119	73	33	103	76	107	99	97	105	117	119	123	156	177	227	309
V. Diseases of the digestive system.....	1,378	450	159	54	30	89	86	92	112	102	96	127	114	118	143	175	225	228
VI. Diseases of the genito-urinary system.....	30	17	9	8	6	16	15	32	43	50	65	79	99	93	136	137	200	188
VII. Puerperal diseases.....							34		85	62	63	49	23	4				
VIII. Diseases of the skin and cellular tissues.....	22	1				1			2	1	2	8	2	5	9	8	11	25
IX. Diseases of the locomotor system.....	4	1	2		1	1	1						1		1		1	4
X. Malformations.....	163	1	1	4		1												
XI. Diseases of infancy.....	1,908																	
XII. Diseases of old age.....																		
XIII. External causes.....	207	64	33	38	15	80	88	163	200	144	146	150	130	118	123	79	5	30
XIV. Causes ill-defined.....	57	26	9	2	1	7	4	1	7	16	13	7	18	19	24	18	41	82
XV. Stillbirths.....	2,236																	
All causes.....	8,277	1,270	571	351	231	777	654	1,177	1,604	1,363	1,288	1,368	1,241	1,309	1,466	1,564	1,968	2,269

TABLE 2A.—Continued.

	70 to 75	75 to 80	80 to 90	90 and over	Unknown	White.	Colored.	American	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
I. General Diseases.—Epidemic.....	522	425	363	43	56	9,340	452	8,893	814	85	3,683	4,467	1,532	110	9,792
II. Diseases of the nervous system and organs of sense.....	416	381	349	40	26	4,220	134	3,836	465	53	1,685	1,615	993	71	4,354
III. Diseases of the circulatory system.....	383	360	269	22	19	2,709	110	2,339	445	35	427	1,448	904	40	2,819
IV. Diseases of the respiratory system.....	364	304	335	47	18	4,296	188	3,924	519	41	2,163	1,367	911	43	4,464
V. Diseases of the digestive system.....	219	191	202	18	13	4,296	125	4,070	320	23	2,543	1,274	569	35	4,421
VI. Diseases of the genito-urinary system.....	232	239	168	17	10	1,815	79	1,566	345	23	290	1,059	511	34	1,564
VII. Puerperal diseases.....	21	23	25	10	2	311	10	307	13	1	14	302	4	1	321
VIII. Diseases of the skin and cellular tissues.....	3	1	3	10	2	174	9	149	29	1	46	77	54	2	179
IX. Diseases of the locomotor system.....	159	282	652	166	1	1,843	65	1,908	317	19	1,908	327	868	27	1,908
X. Malformations.....	70	75	86	20	34	1,257	84	960	240	63	74	788	299	84	2,218
XI. Diseases of infancy.....	20	13	24	2	5	2,134	23	1,915	65	11	1,047	151	92	14	382
XII. Diseases of old age.....	20	13	24	2	5	2,147	89	306	65	11	2,236	151	92	14	382
XIII. External causes.....	20	13	24	2	5	2,147	89	306	65	11	2,236	151	92	14	382
XIV. Causes ill-defined.....	20	13	24	2	5	2,147	89	306	65	11	2,236	151	92	14	382
XV. Stillbirths.....	20	13	24	2	5	2,147	89	306	65	11	2,236	151	92	14	382
All causes.....	2,409	2,299	2,476	385	185	35,096	1,406	32,614	9,532	356	16,428	12,893	6,730	461	36,502

TABLE 3.

Deaths in Indiana by Months, Counties, Ages, Sex, Color, Nationality and Conjugal Condition, 1905.

COUNTIES.	Sex.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Adams	Total.....	28	27	20	22	20	15	16	19	24	15	16	19
	Male.....	18	11	13	11	8	4	6	10	10	8	8	12
	Female.....	10	16	7	11	12	11	10	9	14	7	10	7
Allen	Total.....	87	103	111	66	93	86	74	89	82	75	85	83
	Male.....	44	58	58	34	59	49	38	53	37	42	53	48
	Female.....	43	45	53	32	34	37	36	36	45	33	32	35
Bartholomew	Total.....	31	38	33	19	22	20	24	23	36	31	31	24
	Male.....	13	20	14	12	12	10	7	14	19	17	17	11
	Female.....	18	18	19	7	10	10	17	9	17	14	14	13
Benton	Total.....	17	14	14	7	14	20	11	8	12	11	5	11
	Male.....	12	9	7	6	8	13	6	7	8	4	4	7
	Female.....	5	5	7	1	6	7	5	1	4	7	1	4
Blackford	Total.....	29	32	18	15	20	16	16	26	26	16	14	17
	Male.....	13	16	10	10	12	14	5	21	13	8	8	6
	Female.....	16	16	8	5	8	2	11	14	13	8	6	11
Boone	Total.....	29	39	27	29	17	18	32	30	23	27	31	25
	Male.....	14	38	14	12	4	18	17	14	16	18	12	12
	Female.....	15	21	13	17	13	10	15	16	7	9	19	13
Brown	Total.....	11	10	13	9	10	6	10	7	7	2	3	5
	Male.....	5	4	4	2	6	4	6	5	5	2	2	4
	Female.....	6	6	9	7	4	2	4	2	2	.....	1	1
Carroll	Total.....	26	32	33	11	20	13	11	32	18	20	23	17
	Male.....	14	12	19	5	12	9	4	17	9	8	9	6
	Female.....	12	20	14	6	8	4	7	15	9	12	14	12

Cass	65	62	54	43	35	27	38	56	63	44	51	43
Male.....	31	28	32	23	21	19	15	30	26	25	17	25
Female.....	34	34	22	20	14	8	23	26	37	19	34	18
Clark	44	51	52	30	40	42	48	38	30	34	31	28
Male.....	19	29	29	13	19	22	26	18	16	17	21	18
Female.....	25	22	23	17	21	20	22	20	14	17	10	10
Clay	39	38	34	35	30	17	43	44	34	26	32	35
Male.....	15	19	15	15	17	6	24	19	13	16	18	17
Female.....	24	19	19	20	13	11	19	25	21	10	14	18
Clinton	42	54	42	37	33	32	42	44	28	26	30	43
Male.....	21	26	18	19	12	13	23	29	14	7	18	23
Female.....	21	28	24	18	21	19	19	15	14	19	12	20
Crawford	26	10	13	14	13	17	14	20	16	11	7	8
Male.....	16	4	11	6	7	8	6	8	10	4	5	5
Female.....	10	6	2	8	6	9	8	12	6	7	2	3
Davies	39	44	39	31	29	28	33	34	48	38	37	37
Male.....	20	19	26	14	16	19	18	15	25	19	19	21
Female.....	19	25	13	17	13	9	15	19	23	19	18	16
Dearborn	38	36	35	23	21	23	19	20	37	22	33	27
Male.....	18	22	16	12	12	9	15	8	23	16	15	13
Female.....	20	14	19	16	9	14	4	12	14	6	18	14
Decatur	26	37	32	22	28	28	21	34	31	21	23	13
Male.....	13	16	17	16	17	14	8	19	17	13	10	7
Female.....	13	21	15	6	11	14	13	15	14	8	13	6
Dekalb	26	32	41	25	15	24	17	35	20	27	33	21
Male.....	16	15	19	17	9	11	10	21	14	15	18	10
Female.....	10	17	22	8	6	13	7	14	6	12	15	11
Delaware	76	84	61	58	47	52	57	68	61	59	62	48
Male.....	39	46	32	32	24	31	27	36	40	40	33	25
Female.....	37	38	29	26	23	21	30	32	26	19	29	23
Dubois	30	35	30	15	20	14	36	25	18	23	17	17
Male.....	13	15	7	7	10	5	16	12	10	15	6	10
Female.....	17	20	15	8	10	9	20	13	8	8	11	7
Elkhart	44	53	62	41	62	44	51	50	47	56	48	62
Male.....	15	26	23	26	37	20	27	27	22	27	27	15
Female.....	29	27	34	15	25	24	24	23	25	27	21	35

TABLE 3.—Continued.

COUNTIES.	Sex.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Fayette.....	Total.....	9	15	19	11	12	8	14	15	17	19	13	24
	Male.....	5	6	8	4	4	4	3	6	12	9	4	10
	Female.....	4	9	11	7	8	4	11	7	5	10	9	14
Floyd.....	Total.....	47	84	98	54	33	41	41	48	35	42	38	28
	Male.....	21	21	24	33	14	23	23	18	19	19	22	13
	Female.....	26	23	14	21	19	18	18	30	16	23	16	15
Fountain.....	Total.....	34	33	31	20	14	15	17	20	23	14	17	21
	Male.....	13	16	18	10	5	8	9	13	16	12	11	4
	Female.....	21	17	13	10	9	7	8	7	7	2	6	17
Franklin.....	Total.....	17	24	22	13	7	18	18	16	13	22	14	19
	Male.....	8	8	10	6	3	9	15	8	7	11	6	7
	Female.....	9	14	12	7	4	9	3	8	6	11	8	12
Fulton.....	Total.....	20	26	24	28	28	10	15	26	19	10	18	18
	Male.....	12	9	10	15	11	5	8	14	11	8	11	10
	Female.....	8	17	14	13	17	5	7	12	8	2	7	8
Gibson.....	Total.....	49	42	49	28	32	31	34	37	42	27	34	31
	Male.....	20	20	29	17	12	16	18	16	18	14	13	19
	Female.....	29	22	20	11	20	15	14	21	24	13	21	12
Grant.....	Total.....	88	84	110	68	58	53	69	69	85	61	66	67
	Male.....	46	49	67	34	32	30	41	42	33	33	42	40
	Female.....	42	35	43	34	26	23	28	27	43	28	24	27
Greene.....	Total.....	52	49	48	36	35	42	45	42	39	35	27	46
	Male.....	22	24	23	24	12	23	28	21	20	21	11	25
	Female.....	30	25	25	12	23	19	17	21	19	14	16	21
Hamilton.....	Total.....	45	35	42	36	19	42	37	35	21	34	24	21
	Male.....	20	18	16	19	12	21	19	16	16	18	11	9
	Female.....	25	17	26	17	7	21	18	22	6	16	13	12

Hancock	Total.....	35	33	33	11	22	20	25	21	39	22	16	20	23
	Male.....	23	13	19	14	10	10	17	7	22	11	7	9	14
	Female.....	12	20	14		12	10	17	14	17	11	9	11	14
Harrison	Total.....	23	28	41	30	30	24	14	21	25	17	20	25	13
	Male.....	11	17	19	11	11	11	11	11	15	13	13	11	8
	Female.....	12	11	22	11	13	13	3	10	10	10	7	14	5
Hendricks	Total.....	28	21	30	15	17	17	23	20	29	19	14	25	20
	Male.....	17	12	16	7	9	8	8	11	15	11	5	9	11
	Female.....	11	9	14	8			15	9	14	8	5	15	9
Henry	Total.....	30	41	26	23	22	22	22	30	33	31	22	32	32
	Male.....	16	27	15	12	12	11	11	17	18	13	10	17	13
	Female.....	14	14	11	17	12	11	11	13	15	18	12	15	19
Howard	Total.....	32	48	41	28	32	27	27	32	34	36	27	35	42
	Male.....	19	32	14	15	17	13	24	21	21	17	15	17	18
	Female.....	13	16	27	13	15	14	8	8	13	19	12	18	24
Huntington	Total.....	38	31	29	32	28	28	21	26	34	35	27	11	20
	Male.....	18	12	17	19	15	13	13	17	20	17	12	6	13
	Female.....	20	19	12	13	13	13	8	9	14	18	15	5	7
Jackson	Total.....	49	47	44	43	25	28	28	23	35	24	30	32	32
	Male.....	25	28	20	21	16	16	16	13	16	15	12	12	11
	Female.....	24	19	24	22	9	12	12	10	19	9	18	13	21
Jasper	Total.....	10	14	14	5	13	11	11	8	8	17	7	5	13
	Male.....	5	7	10	4	4	6	6	3	7	10	3	5	8
	Female.....	5	7	4	1	9	5	5	5	1	7	4	.....	5
Jay	Total.....	21	36	38	29	28	25	25	30	38	46	37	31	19
	Male.....	12	20	20	13	12	8	8	16	15	18	19	20	12
	Female.....	9	16	18	16	16	17	17	14	23	28	18	11	7
Jefferson	Total.....	34	59	35	18	13	22	28	28	25	26	31	26	31
	Male.....	16	25	19	10	7	9	9	19	13	15	14	14	12
	Female.....	18	34	16	8	6	13	13	7	13	11	17	14	19
Jennings	Total.....	19	27	34	14	21	9	9	19	17	11	22	23	10
	Male.....	10	17	17	6	12	4	4	8	8	8	13	14	8
	Female.....	9	10	17	8	9	5	5	11	9	3	9	9	7
Johnson	Total.....	34	23	29	18	23	16	16	23	24	15	22	15	18
	Male.....	14	12	15	10	12	8	8	18	11	8	12	10	11
	Female.....	20	11	14	8	11	8	8	13	13	7	10	5	7

TABLE 3.—Continued.

COUNTIES.	Sex.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Knox.....	Total.....	48	57	56	46	39	37	49	40	37	52	39	48
	Male.....	21	29	29	22	20	26	28	22	19	19	19	21
	Female ..	27	28	27	24	19	11	23	18	18	23	20	27
Kosciusko.....	Total.....	41	37	36	18	29	23	19	36	52	24	31	19
	Male.....	26	21	21	13	12	8	11	18	29	15	17	11
	Female.....	15	16	15	5	17	15	8	18	23	13	14	8
Lagrange.....	Total.....	24	23	19	18	11	14	13	20	16	19	19	25
	Male.....	12	13	12	10	8	6	11	10	8	9	13	12
	Female.....	12	10	7	8	3	7	2	10	8	10	6	13
Lake.....	Total.....	45	56	66	42	52	47	52	62	73	57	49	38
	Male.....	23	32	43	29	31	34	29	36	41	31	26	24
	Female.....	17	24	23	13	21	13	23	26	32	26	23	14
Laporte.....	Total.....	46	47	66	41	45	44	35	52	54	45	43	53
	Male.....	18	25	39	21	28	17	24	23	23	27	23	31
	Female.....	28	22	27	20	19	27	11	30	31	18	18	22
Lawrence.....	Total.....	47	36	36	31	37	40	34	39	34	35	27	28
	Male.....	24	18	18	12	17	15	15	20	17	17	12	17
	Female.....	23	18	18	19	20	25	19	19	17	18	15	11
Madison.....	Total.....	91	82	79	63	61	54	50	95	79	60	65	60
	Male.....	52	45	45	35	33	25	48	64	44	34	42	27
	Female.....	39	37	34	28	28	29	42	41	35	26	23	33
Marion.....	Total.....	324	336	345	297	308	260	337	306	294	278	283	306
	Male.....	173	184	176	169	165	142	190	160	162	141	145	149
	Female.....	151	152	169	138	143	118	147	146	132	137	138	157
Marshall.....	Total.....	36	26	33	23	15	14	17	24	20	25	23	13
	Male.....	15	10	15	11	9	7	9	11	9	17	10	4
	Female.....	21	16	18	12	6	7	8	13	11	8	13	9

Martin.....	Total.....	13	29	16	10	16	13	12	16	8	13	19
	Male.....	10	12	9	5	10	7	6	10	2	7	7
Miami.....	Female.....	3	17	7	5	6	6	6	6	6	6	12
	Total.....	31	37	30	21	25	28	33	36	30	25	28
Monroe.....	Male.....	18	19	19	13	13	15	21	18	16	13	17
	Female.....	13	14	11	8	12	13	12	18	14	12	11
Montgomery.....	Total.....	29	41	36	14	30	20	30	22	16	16	16
	Male.....	13	19	20	8	10	13	13	10	17	8	8
Morgan.....	Female.....	16	22	16	6	20	7	17	12	10	8	8
	Total.....	45	36	47	29	36	36	36	43	25	33	28
Morgan.....	Male.....	25	21	24	14	23	24	12	21	10	10	12
	Female.....	20	15	23	15	13	12	24	22	13	23	16
Newton.....	Total.....	35	33	31	23	23	16	27	22	17	29	29
	Male.....	14	23	17	8	16	10	16	11	8	17	10
Noble.....	Female.....	21	10	14	15	7	6	11	11	9	12	19
	Total.....	11	13	9	7	11	9	7	10	8	11	10
Ohio.....	Male.....	8	7	6	4	7	6	5	6	7	5	8
	Female.....	3	6	3	3	4	3	2	4	1	6	2
Orange.....	Total.....	17	26	27	23	18	25	16	32	26	28	12
	Male.....	6	17	13	14	9	16	9	18	14	14	5
Owen.....	Female.....	11	9	14	9	9	9	12	14	12	14	7
	Total.....	6	6	9	4	3	3	7	3	8	6	.....
Parke.....	Male.....	1	4	5	2	2	2	3	1	6	2	.....
	Female.....	5	2	4	2	1	1	4	2	2	4	.....
Perry.....	Total.....	26	23	26	12	12	12	16	11	16	22	22
	Male.....	9	12	10	4	4	8	11	6	7	11	11
Perry.....	Female.....	17	11	16	5	8	4	5	5	9	12	11
	Total.....	19	27	12	7	11	16	13	14	10	16	14
Perry.....	Male.....	11	13	7	4	5	6	8	9	7	9	6
	Female.....	8	14	5	3	6	10	5	5	3	7	8
Perry.....	Total.....	41	42	38	22	29	17	19	27	23	23	23
	Male.....	23	27	17	12	11	8	11	15	9	13	11
Perry.....	Female.....	18	15	21	10	18	9	8	12	14	10	12
	Total.....	28	30	29	22	23	31	14	24	12	16	12
Perry.....	Male.....	11	14	10	8	11	12	9	15	7	6	6
	Female.....	17	16	19	14	12	19	5	9	5	10	6

TABLE 3.—Continued.

COUNTIES.	Sex.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Pike.....	Total.....	44	35	30	30	20	14	18	27	33	28	20	27
	Male.....	22	19	9	17	10	7	9	15	17	10	11	11
	Female.....	22	16	21	13	10	7	9	12	16	18	9	16
Porter.....	Total.....	29	31	19	14	20	16	32	26	14	19	16	23
	Male.....	17	14	12	9	11	10	19	19	10	10	6	16
	Female.....	12	17	7	5	9	6	13	14	8	9	10	7
Posey.....	Total.....	24	26	33	33	18	20	31	23	39	33	23	16
	Male.....	11	11	16	17	11	14	16	10	23	16	15	8
	Female.....	14	15	17	16	11	6	15	13	16	17	8	8
Pulaski.....	Total.....	15	13	12	17	11	6	7	10	10	10	7	10
	Male.....	11	5	6	11	8	4	4	3	6	4	3	6
	Female.....	4	8	4	6	3	2	3	7	4	6	4	4
Putnam.....	Total.....	38	34	38	16	14	19	22	18	19	21	22	22
	Male.....	18	15	19	13	8	9	13	7	8	9	9	9
	Female.....	20	19	19	3	8	10	9	11	11	12	13	13
Randolph.....	Total.....	24	35	32	34	35	27	32	41	44	35	21	29
	Male.....	10	19	14	19	19	12	15	23	22	16	12	12
	Female.....	14	16	18	15	13	15	17	18	22	19	9	17
Ripley.....	Total.....	24	32	28	20	22	15	23	19	15	24	22	16
	Male.....	8	16	13	12	7	7	13	6	8	14	8	10
	Female.....	16	16	15	8	15	8	10	13	7	10	14	6
Rush.....	Total.....	18	25	16	19	17	13	10	18	20	22	23	20
	Male.....	8	16	11	10	6	7	7	12	12	12	14	12
	Female.....	10	9	5	9	11	6	3	6	8	10	14	8
Scott.....	Total.....	13	27	9	8	4	9	14	11	7	7	9	9
	Male.....	7	17	3	3	2	4	6	5	6	2	3	2
	Female.....	6	10	6	5	2	5	8	6	1	5	6	7

Shelby.....	Total.....	39	50	42	23	22	16	23	32	41	17	22	31
Male.....	Male.....	21	25	21	11	10	8	8	19	20	9	8	13
Female.....	Female.....	18	25	21	13	12	8	19	15	21	8	14	18
Spencer.....	Total.....	25	39	18	27	19	19	26	25	20	17	19	23
Male.....	Male.....	15	18	11	15	12	9	16	10	11	9	9	12
Female.....	Female.....	10	21	7	12	7	10	16	15	9	8	10	11
Stark.....	Total.....	18	10	10	14	11	13	13	13	9	10	13	13
Male.....	Male.....	13	6	5	8	7	4	8	6	4	4	8	7
Female.....	Female.....	5	4	5	6	4	9	5	7	5	6	5	6
Steuben.....	Total.....	12	27	16	18	20	15	10	14	20	23	18	13
Male.....	Male.....	7	14	6	12	11	7	1	5	10	9	10	9
Female.....	Female.....	5	13	10	6	9	8	9	9	10	13	8	4
St. Joseph.....	Total.....	31	90	110	93	88	72	105	98	89	79	86	95
Male.....	Male.....	34	49	51	46	53	38	60	47	50	38	49	50
Female.....	Female.....	47	41	59	47	35	34	45	51	39	41	37	45
Sullivan.....	Total.....	45	51	43	37	32	26	30	39	50	43	34	35
Male.....	Male.....	23	31	36	19	14	11	13	19	15	24	24	20
Female.....	Female.....	22	20	17	18	18	15	17	20	35	19	10	15
Switzerland.....	Total.....	12	19	20	4	14	10	14	10	15	11	5	8
Male.....	Male.....	5	11	12	3	8	4	7	4	9	7	2	7
Female.....	Female.....	7	8	8	1	6	6	7	6	6	4	3	1
Tippecanoe.....	Total.....	59	75	58	56	56	52	43	39	47	51	42	54
Male.....	Male.....	26	47	26	26	25	29	29	21	29	30	27	36
Female.....	Female.....	33	28	32	26	30	23	14	18	18	21	15	18
Tipton.....	Total.....	21	18	22	21	17	13	17	25	19	19	20	22
Male.....	Male.....	9	9	13	12	8	5	9	14	7	11	7	11
Female.....	Female.....	12	9	9	9	9	8	8	11	12	8	13	11
Union.....	Total.....	7	12	10	11	4	4	7	8	4	4	9	5
Male.....	Male.....	3	8	6	6	2	2	5	4	1	2	6	3
Female.....	Female.....	4	4	4	5	2	2	2	4	3	2	3	2
Vanderburgh.....	Total.....	98	136	96	85	70	99	99	99	90	95	99	95
Male.....	Male.....	61	81	44	48	36	52	48	41	50	53	54	51
Female.....	Female.....	37	55	52	37	34	47	51	58	40	42	45	44
Vermillion.....	Total.....	19	27	28	21	10	26	15	25	25	28	18	16
Male.....	Male.....	9	13	12	10	3	15	7	14	13	16	9	9
Female.....	Female.....	10	14	16	11	7	11	8	11	12	12	11	7

TABLE 4. Continued

COUNTRIES	Sex	Year									
		Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct
Vigo	Total	10	10	10	10	10	10	10	10	10	10
	Male	04	04	04	04	04	04	04	04	04	04
	Female	06	06	06	06	06	06	06	06	06	06
Watash	Total	04	04	04	04	04	04	04	04	04	04
	Male	00	00	00	00	00	00	00	00	00	00
	Female	04	04	04	04	04	04	04	04	04	04
Warren	Total	17	17	17	17	17	17	17	17	17	17
	Male	06	06	06	06	06	06	06	06	06	06
	Female	11	11	11	11	11	11	11	11	11	11
Warwick	Total	41	41	41	41	41	41	41	41	41	41
	Male	16	16	16	16	16	16	16	16	16	16
	Female	25	25	25	25	25	25	25	25	25	25
Washington	Total	47	47	47	47	47	47	47	47	47	47
	Male	16	16	16	16	16	16	16	16	16	16
	Female	31	31	31	31	31	31	31	31	31	31
Wayne	Total	01	01	01	01	01	01	01	01	01	01
	Male	00	00	00	00	00	00	00	00	00	00
	Female	01	01	01	01	01	01	01	01	01	01
Wells	Total	34	34	34	34	34	34	34	34	34	34
	Male	14	14	14	14	14	14	14	14	14	14
	Female	20	20	20	20	20	20	20	20	20	20
White	Total	34	34	34	34	34	34	34	34	34	34
	Male	14	14	14	14	14	14	14	14	14	14
	Female	20	20	20	20	20	20	20	20	20	20

Whitley	21	13	23	14	15	12	14	14	21	14	17	11
Male	12	9	13	5	11	7	6	5	9	7	8	8
Female	9	4	10	9	4	5	8	9	12	7	9	3
Total	1,773	2,04	1,881	1,476	1,400	1,338	1,570	1,639	1,615	1,467	1,486	1,425
Total males	1,706	1,815	1,768	1,290	1,290	1,208	1,363	1,535	1,476	1,334	1,277	1,377
Total females												
Grand total	3,479	3,819	3,629	2,766	2,690	2,516	2,932	3,174	3,091	2,801	2,773	2,802

TABLE 3.—Continued.

Deaths in Indiana by Months, Counties, Ages, Sex, Color, Nationality and Conjugal Condition, 1905.

COUNTIES.	Sex.	0	1	2	3	4	5	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.
Adams.....	Total.....	61	13	3	2	3	13	3	8	8	10	6	5	6	9	7	10	14	12
	Male.....	32	9	2	2	1	10	3	8	3	6	3	3	2	5	3	4	6	6
	Female.....	29	4	1	1	.....	3	.....	.....	5	5	.....	.....	.....	4	4	6	8	6
Allen.....	Total.....	232	25	14	5	1	16	24	37	50	39	38	44	46	36	43	58	48	68
	Male.....	135	15	6	3	1	5	14	19	27	17	16	27	24	20	26	35	27	38
	Female.....	97	10	8	2	.....	11	10	18	23	22	22	17	22	16	17	23	21	30
Bartholomew.....	Total.....	81	14	2	3	1	14	4	7	13	9	11	13	8	3	12	7	18	28
	Male.....	43	8	.....	1	.....	8	2	3	6	5	6	6	3	1	5	4	9	14
	Female.....	38	6	2	2	1	6	2	4	7	4	4	7	5	2	7	3	9	14
Benton.....	Total.....	40	8	2	1	1	5	2	3	6	4	3	5	1	2	3	6	4	16
	Male.....	28	6	.....	.....	.....	3	1	2	2	3	2	3	.....	2	2	3	4	12
	Female.....	12	2	2	.....	1	2	1	1	4	1	1	2	1	.....	1	3	3	4
Blackford.....	Total.....	68	3	3	3	3	8	5	5	12	13	12	14	10	10	6	9	15	18
	Male.....	42	1	3	1	2	2	2	.....	7	6	6	6	6	8	3	1	6	7
	Female.....	26	2	.....	2	1	6	3	5	5	7	6	4	4	2	3	8	9	6
Boone.....	Total.....	74	12	5	2	.....	9	10	10	20	8	12	7	11	12	8	7	19	17
	Male.....	43	3	2	1	.....	5	5	5	13	4	8	4	6	6	6	3	7	10
	Female.....	31	9	3	1	.....	4	9	5	7	4	4	3	5	6	2	4	12	7
Brown.....	Total.....	14	3	1	1	1	2	3	3	3	4	4	5	1	2	3	4	3	4
	Male.....	7	2	1	1	.....	1	.....	.....	2	2	1	2	.....	1	2	4	3	4
	Female.....	7	1	.....	.....	1	1	.....	2	1	2	3	3	1	2	2	.....	1	1
Carroll.....	Total.....	64	10	3	2	2	3	5	10	17	12	3	9	6	6	8	7	17	12
	Male.....	30	7	2	.....	1	1	4	3	7	3	.....	1	4	3	5	2	8	9
	Female.....	34	3	1	2	1	2	1	7	10	9	3	8	2	3	3	5	9	3

Cass.....	Total.....	93	18	11	3	2	15	4	11	20	20	22	20	29	32	25	29	37	29
	Male.....	54	10	7	1	1	6	1	6	12	11	10	7	17	13	13	19	23	19
Clark.....	Total.....	105	23	9	6	4	9	8	11	17	20	21	14	21	16	17	16	27	35
	Male.....	64	13	7	3	2	5	5	6	12	13	10	8	15	7	6	9	16	22
Clay.....	Total.....	101	14	14	3	4	15	7	18	14	23	22	10	12	11	9	15	27	25
	Male.....	59	10	8	2	3	6	2	4	9	16	12	8	8	3	6	10	12	16
Clinton.....	Total.....	109	13	6	3	1	9	9	14	24	16	15	19	11	17	21	20	22	34
	Male.....	55	7	4	1	4	4	5	6	10	16	15	11	9	9	10	10	11	15
Crawford.....	Total.....	45	6	5	4	.....	5	.....	8	10	9	4	5	4	2	4	8	8	9
	Male.....	26	3	2	4	.....	3	.....	1	5	3	1	2	1	.....	3	5	5	6
Davies.....	Total.....	118	24	10	5	3	12	8	13	17	15	11	20	14	14	16	14	15	23
	Male.....	67	13	8	3	1	6	5	7	4	6	3	6	16	8	6	11	7	14
Dearborn.....	Total.....	64	5	7	3	2	6	7	11	15	11	7	7	11	16	11	11	23	16
	Male.....	37	2	4	1	1	6	5	7	9	6	5	2	5	11	6	7	11	7
Decatur.....	Total.....	66	5	6	2	1	5	1	6	15	12	10	15	14	3	14	16	19	20
	Male.....	40	1	3	.....	1	1	1	4	5	5	5	4	9	2	6	9	14	10
DeKalb.....	Total.....	72	8	3	6	.....	8	4	11	11	11	8	9	8	6	14	14	22	19
	Male.....	43	5	2	.....	.....	5	2	8	8	3	2	6	5	3	9	9	9	13
Delaware.....	Total.....	191	29	8	5	5	25	15	27	34	28	26	31	32	34	32	25	29	26
	Male.....	112	16	5	.....	2	8	14	14	19	16	16	20	17	15	21	12	18	14
Dubois.....	Total.....	34	8	5	2	2	6	7	7	19	11	6	9	8	11	12	10	15	13
	Male.....	34	6	3	3	.....	3	5	5	9	10	2	2	4	7	9	4	10	5
Elkhart.....	Total.....	116	16	11	.....	3	7	7	16	23	17	20	23	19	20	31	30	38	57
	Male.....	64	12	2	.....	1	6	9	9	10	6	5	9	11	10	17	13	22	28
	Female.....	52	4	9	.....	2	1	5	7	12	11	15	14	8	10	14	17	16	29

TABLE 3.—Continued.

COUNTIES.	Sex.	0	1	2	3	4	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.
Fayette.....	Total.....	36	6	2	2	.....	5	2	7	3	11	10	6	4	6	7	7	7	6
	Male.....	17	3	1	.....	.....	3	1	3	3	5	1	5	2	5	3	3	2	5
	Female.....	19	3	1	2	.....	2	1	4	4	6	9	5	2	1	4	4	5	2
Floyd.....	Total.....	87	11	11	1	5	10	14	19	19	22	16	16	18	21	25	23	37	22
	Male.....	45	7	9	.....	4	4	6	6	7	10	7	9	12	12	15	8	20	10
	Female.....	42	4	2	1	1	6	8	13	12	12	9	7	6	9	10	15	17	12
Fountain.....	Total.....	58	8	6	2	1	5	3	6	10	6	20	9	7	8	9	14	8	17
	Male.....	32	4	5	.....	.....	5	.....	3	1	5	9	4	6	5	5	9	4	14
	Female.....	26	4	1	2	.....	.....	3	3	9	1	11	5	2	3	4	5	4	3
Franklin.....	Total.....	48	6	.....	.....	.....	2	3	7	6	5	4	10	10	6	3	8	15	9
	Male.....	21	3	.....	.....	.....	2	3	3	.....	2	4	6	4	4	3	10	5	6
	Female.....	27	3	.....	.....	.....	.....	.....	4	6	3	3	4	2	2	.....	5	4	4
Fulton.....	Total.....	54	9	4	3	2	3	3	6	16	6	8	7	10	1	8	8	18	18
	Male.....	32	4	1	.....	.....	2	2	3	9	4	2	2	6	.....	5	4	5	5
	Female.....	22	5	3	2	2	1	1	3	7	2	6	5	4	4	3	4	13	8
Gibson.....	Total.....	121	14	11	5	3	8	11	14	20	19	21	13	10	16	20	18	22	23
	Male.....	62	6	6	3	2	4	6	5	9	8	10	5	8	10	12	7	10	13
	Female.....	59	8	5	2	1	4	5	9	11	11	11	8	7	6	8	11	12	10
Grant.....	Total.....	221	28	10	5	5	17	20	34	37	33	27	23	18	26	39	37	67	62
	Male.....	133	13	6	1	.....	10	6	14	14	14	12	9	10	11	16	19	56	44
	Female.....	88	15	4	4	5	7	14	20	18	19	15	14	6	15	23	18	11	18
Greene.....	Total.....	129	27	13	9	10	14	8	29	28	23	18	16	12	16	13	16	4	25
	Male.....	66	15	5	6	4	7	7	15	9	12	6	8	6	7	7	10	2	17
	Female.....	63	12	8	3	6	7	2	14	19	11	12	8	6	9	6	6	2	8
Hamilton.....	Total.....	77	13	10	5	1	7	6	11	17	11	13	16	15	15	9	17	17	29
	Male.....	46	4	5	4	1	4	2	1	6	4	3	6	9	3	6	11	10	15
	Female.....	31	9	5	1	.....	3	4	10	11	7	10	7	7	12	3	6	7	14

Hancock	Total.....	80	13	5	2	.....	6	5	9	16	7	5	13	10	11	5	18	15	19
	Male.....	48	9	2	1	.....	2	2	4	9	2	1	7	2	3	2	9	9	7
Harrison	Total.....	59	7	2	1	2	5	9	16	11	8	12	12	10	9	8	9	13	19
	Male.....	39	1	1	1	.....	3	4	5	6	7	7	6	3	6	5	5	9	7
Hendricks	Total.....	20	6	1	.....	2	2	5	11	5	1	9	9	7	3	3	6	4	12
	Male.....	54	9	3	.....	.....	2	7	12	15	7	8	7	8	9	14	14	12	19
Henry	Total.....	26	7	1	.....	.....	.....	2	8	3	3	3	5	4	5	5	7	6	9
	Male.....	28	2	2	.....	.....	2	2	4	12	4	5	2	4	4	5	7	6	10
Howard	Total.....	77	5	3	3	2	9	4	11	14	17	12	9	10	11	12	17	24	17
	Male.....	43	4	2	3	.....	2	1	5	7	9	6	3	5	8	7	8	12	10
Howard	Total.....	34	1	1	.....	.....	7	3	6	7	8	6	6	5	3	5	9	12	7
	Male.....	107	7	7	4	2	7	12	17	17	5	7	10	15	19	19	18	26	24
Huntington	Total.....	61	4	4	4	1	4	5	10	6	3	4	7	7	12	13	10	15	13
	Male.....	46	3	3	.....	1	3	7	7	11	2	3	3	8	7	6	8	11	11
Jackson	Total.....	70	13	3	2	1	6	5	6	14	14	12	8	13	14	20	20	19	27
	Male.....	38	8	2	2	.....	.....	4	2	6	11	7	6	5	7	15	8	12	18
Jasper	Total.....	32	5	1	2	1	6	1	4	8	3	5	2	8	7	5	12	7	9
	Male.....	122	27	6	4	.....	10	5	26	14	16	13	13	10	17	13	13	18	17
Jay	Total.....	72	14	2	3	.....	5	2	13	3	8	4	6	5	8	5	5	12	7
	Male.....	50	13	4	1	.....	5	3	13	11	8	9	7	5	9	8	7	6	10
Jefferson	Total.....	29	5	1	3	.....	1	2	4	6	4	2	3	5	.....	8	4	3	9
	Male.....	18	2	1	1	.....	1	2	2	3	1	1	1	2	.....	3	4	.....	8
Jennings	Total.....	101	23	7	6	1	6	7	11	15	13	13	16	14	8	13	15	20	29
	Male.....	55	8	4	3	.....	3	6	4	5	8	9	9	5	3	9	8	10	12
Johnson	Total.....	46	15	3	3	1	3	2	7	10	8	5	7	6	5	4	8	10	17
	Male.....	52	11	9	5	4	8	3	14	17	7	7	11	12	11	7	19	25	20
Jennings	Total.....	32	6	6	4	2	6	2	6	8	6	4	8	9	6	3	8	10	13
	Male.....	20	5	3	1	2	3	1	8	9	9	3	8	3	5	4	11	15	7
Johnson	Total.....	31	5	5	2	1	7	4	6	10	7	7	11	7	6	8	9	16	19
	Male.....	20	2	2	2	1	4	3	4	6	4	6	2	3	5	4	4	9	10
Johnson	Total.....	11	3	3	.....	.....	4	1	2	4	3	6	2	4	1	4	5	7	9
	Male.....	53	7	1	2	3	7	5	8	12	9	9	11	11	8	13	12	15	14
Johnson	Total.....	25	3	1	1	.....	3	2	6	5	.....	4	6	7	4	10	7	10	6
	Female.....	28	4	.....	1	.....	4	3	2	7	9	4	6	4	4	3	5	6	9

TABLE 2.—Continued.

LOCALITY	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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Martin.....	39	12	1	4	1	1	5	3	4	6	14	7	6	9	1	8	6	11
Male.....	20	5	1	1	1	1	3	2	3	2	6	2	4	4	1	3	3	4
Female.....	19	7	3	3	3	3	1	2	1	2	8	5	2	5	1	5	3	7
Miami.....	80	14	4	3	3	14	10	3	15	8	10	15	13	9	10	16	16	33
Male.....	47	10	1	1	1	9	3	2	8	4	3	6	4	5	8	12	8	17
Female.....	33	4	3	2	2	5	7	1	7	4	7	9	3	4	7	4	8	16
Monroe.....	86	14	7	5	1	13	15	5	5	11	15	6	12	8	15	8	22	23
Male.....	51	5	3	4	1	6	7	5	4	3	7	1	9	4	7	6	13	13
Female.....	35	9	4	1	1	8	8	1	4	6	8	5	3	4	8	2	9	10
Montgomery.....	87	10	2	2	2	8	16	5	8	12	15	15	16	9	10	20	28	30
Male.....	39	6	2	2	2	3	4	3	4	2	5	5	2	3	8	9	14	14
Female.....	48	4	3	3	3	4	13	2	4	10	10	10	13	6	2	11	10	16
Morgan.....	63	11	3	1	1	14	16	6	6	12	13	13	6	13	5	10	16	22
Male.....	34	5	2	1	1	7	8	3	1	4	8	10	4	4	3	4	8	15
Female.....	29	6	1	1	1	7	8	3	5	7	7	3	2	9	2	6	8	7
Newton.....	31	5	2	3	1	3	3	5	1	1	3	4	6	3	3	3	5	7
Male.....	24	3	1	2	1	1	2	3	1	1	2	2	3	2	1	2	4	5
Female.....	7	2	1	1	1	2	1	2	1	1	2	2	3	1	2	1	1	2
Noble.....	48	7	4	4	1	8	9	3	8	12	9	12	4	6	10	9	17	20
Male.....	26	3	3	3	1	3	6	2	3	6	3	6	3	2	7	5	10	11
Female.....	22	4	1	1	1	5	3	1	5	1	2	2	1	4	3	4	7	9
Ohio.....	3	6	1	2	1	1	2	1	3	2	2	2	2	1	3	1	4	6
Male.....	2	5	1	1	1	3	9	2	1	3	2	1	1	1	3	1	3	3
Female.....	1	1	1	1	1	3	1	1	3	1	1	1	1	1	3	1	1	3
Orange.....	46	11	4	5	2	10	9	5	8	9	9	11	9	3	9	9	7	17
Male.....	25	6	2	2	1	4	7	2	3	6	2	5	3	1	5	4	4	10
Female.....	21	5	4	3	1	8	2	3	5	3	7	6	6	2	4	4	3	7
Owen.....	26	5	3	1	1	4	10	8	2	9	9	9	8	3	5	14	15	13
Male.....	14	3	1	1	1	2	10	4	4	7	10	9	1	6	4	7	10	11
Female.....	12	2	2	1	1	1	9	1	1	2	9	2	7	2	1	3	5	2
Parke.....	66	14	5	9	3	5	16	3	10	11	16	11	15	8	13	6	15	18
Male.....	44	9	2	2	1	3	6	2	5	4	6	3	6	4	6	4	10	10
Female.....	22	5	3	7	2	2	8	1	7	9	10	8	9	4	7	2	7	8
Perry.....	54	7	7	2	1	13	11	4	13	12	11	14	9	13	11	9	19	14
Male.....	24	5	3	2	1	4	8	1	4	6	6	5	3	6	6	3	8	7
Female.....	30	2	4	1	3	9	3	1	9	6	5	9	6	6	5	6	11	7

TABLE 3.—Continued.

COUNTIES.	Sex.	0	1	2	3	4	5 to 10.	10 to 15.	15 to 20.	20 to 25.	25 to 30.	30 to 35.	35 to 40.	40 to 45.	45 to 50.	50 to 55.	55 to 60.	60 to 65.	65 to 70.
Pike	Total.....	89	24	3	3	2	13	10	11	13	11	11	10	6	12	13	7	15	22
	Male.....	49	8	3	1	2	7	3	4	10	4	5	6	1	5	6	3	7	9
	Female.....	40	16	3	2	...	6	7	7	3	7	6	4	5	7	7	4	8	13
Porter	Total.....	52	5	4	1	...	7	6	6	9	10	7	17	10	7	6	10	14	18
	Male.....	28	4	3	...	...	7	3	4	4	6	2	12	6	3	4	5	5	11
	Female.....	25	1	1	1	...	...	3	2	5	4	5	5	4	4	2	5	9	7
Posey	Total.....	87	16	8	5	3	6	5	16	13	17	5	10	7	10	11	22	10	17
	Male.....	46	9	6	3	2	2	4	7	6	4	4	5	1	7	7	11	2	7
	Female.....	41	7	2	3	1	4	1	9	7	13	1	5	6	3	4	11	8	10
Pulaski	Total.....	23	7	2	1	3	3	1	4	6	2	2	1	1	8	5	6	8	10
	Male.....	13	3	2	1	2	1	...	3	2	1	...	...	4	1	5	3	6	8
	Female.....	8	4	...	...	...	2	1	1	4	1	2	...	3	3	1	3	2	5
Putnam	Total.....	52	6	...	3	1	2	5	14	10	14	15	9	8	11	10	11	21	14
	Male.....	22	3	...	3	...	...	2	5	6	8	8	2	7	7	5	7	14	5
	Female.....	30	3	...	...	1	...	3	9	4	6	7	7	1	4	5	4	7	9
Randolph	Total.....	86	13	10	1	1	6	3	15	8	15	14	14	10	12	13	10	22	36
	Male.....	45	7	5	1	1	...	2	6	2	6	7	5	6	6	7	6	11	18
	Female.....	41	6	5	...	...	6	1	9	6	9	7	9	4	6	6	4	11	18
Ripley	Total.....	41	3	3	1	2	8	5	11	13	4	14	11	5	7	7	13	19	19
	Male.....	25	...	2	...	1	6	1	6	3	3	5	5	2	5	3	6	11	7
	Female.....	16	3	1	1	1	2	4	4	7	1	9	6	3	2	2	7	8	12
Rush	Total.....	43	6	2	1	2	5	3	3	11	8	3	8	10	8	15	11	8	20
	Male.....	23	5	1	1	1	4	2	4	6	4	...	5	6	4	10	8	3	12
	Female.....	20	1	1	...	1	1	1	...	5	4	3	3	4	4	5	3	5	8
Scott	Total.....	22	6	4	...	...	2	2	8	2	2	7	5	4	3	2	8	4	5
	Male.....	10	2	...	...	...	1	1	3	...	...	5	1	3	2	1	1	1	2
	Female.....	12	4	4	...	...	1	...	6	2	...	2	...	1	1	...	7	3	3

Shelby.....	73	11	4	4	5	10	4	13	12	10	15	14	10	15	19	32
Male.....	42	6	1	1	5	6	4	8	5	10	6	7	2	12	18	14
Female.....	31	5	3	3	5	4	.....	.....	7	.....	9	10	8	3	9	14
Spencer.....	58	11	3	1	1	5	9	9	8	13	15	12	11	9	7	19
Male.....	43	3	1	1	1	3	6	5	1	4	14	1	7	5	4	9
Female.....	15	8	.....	.....	.....	2	3	4	7	9	10	7	4	4	3	10
Starke.....	37	9	4	1	1	3	3	7	8	2	3	4	2	4	9	8
Male.....	24	4	2	1	.....	1	.....	.....	2	1	.....	2	.....	2	4	4
Female.....	13	5	2	.....	1	1	3	3	6	1	1	2	2	2	5	4
Steuben.....	32	2	3	1	2	4	6	7	6	5	8	5	6	8	13	12
Male.....	23	2	1	1	1	1	4	5	3	1	4	3	2	3	7	6
Female.....	9	.....	1	.....	.....	3	2	2	3	4	2	4	2	5	6	6
St. Joseph.....	865	33	16	8	8	24	21	25	44	39	37	30	43	40	46	46
Male.....	194	21	10	5	5	13	14	5	18	21	17	17	32	24	20	20
Female.....	171	12	6	3	3	11	7	20	26	18	20	13	11	16	24	26
Sullivan.....	131	29	15	9	6	10	13	16	17	22	10	16	14	9	15	19
Male.....	73	14	7	5	2	4	8	9	7	12	6	8	7	7	9	9
Female.....	58	15	8	4	4	6	5	7	10	10	4	8	6	2	8	10
Switzerland.....	26	2	2	2	.....	4	5	4	7	8	3	3	1	5	11	6
Male.....	11	.....	.....	.....	.....	2	3	3	4	.....	2	1	2	4	6	5
Female.....	15	2	.....	.....	.....	2	2	1	3	5	1	2	.....	1	5	1
Tippecanoe.....	86	10	5	7	5	10	8	14	24	29	25	30	16	28	52	60
Male.....	52	8	1	5	2	6	6	5	17	13	10	15	10	15	34	36
Female.....	34	2	4	2	3	4	2	9	7	16	15	15	11	11	18	24
Tipton.....	56	11	8	3	.....	.....	2	9	6	12	7	4	5	13	14	19
Male.....	29	7	2	1	.....	.....	2	5	1	1	6	2	4	4	8	11
Female.....	27	4	6	2	.....	.....	.....	4	5	11	1	2	1	9	6	8
Union.....	7	1	1	1	.....	.....	1	1	4	.....	3	.....	3	.....	8	11
Male.....	5	.....	.....	.....	.....	.....	.....	.....	3	.....	2	.....	1	.....	5	6
Female.....	2	1	.....	.....	.....	.....	1	1	1	.....	2	.....	.....	.....	3	.....
Vanderburgh.....	265	32	20	18	13	29	20	32	58	56	55	56	68	45	57	54
Male.....	158	18	9	9	5	13	10	13	29	16	26	33	44	43	31	26
Female.....	107	14	11	9	8	16	10	19	29	40	23	23	21	23	26	28
Vermillion.....	79	13	1	3	2	3	6	10	9	16	7	9	5	7	10	13
Male.....	43	6	.....	2	2	1	4	3	4	13	3	6	3	4	4	10
Female.....	36	7	1	1	.....	1	2	7	5	3	4	2	2	5	6	3

TABLE 3.—Continued.

COUNTIES.	Sex.	0	1	2	3	4	5	10	15	20	25	30	35	40	45	50	55	60	65
								to 15.	to 20.	to 25.	to 30.	to 35.	to 40.	to 45.	to 50.	to 55.	to 60.	to 65.	to 70.
Vigo.....	Total.....	284	50	15	15	11	25	26	44	60	39	42	53	45	41	56	50	48	59
	Male.....	168	25	6	11	6	13	14	21	33	21	26	23	23	25	30	31	29	32
	Female.....	116	25	9	4		12	12	23	27	18	16	30	23	16	26	19	19	27
Wabash.....	Total.....	65	6	10	2	5	7	8	8	23	5	10	10	6	15	16	19	14	22
	Male.....	37	4	6	1	3	3	2		8	4	5	6	3	8	11	10	6	11
	Female.....	28	2	4	1	2	4			15	1	5	4	3	7	5	9	8	11
Warren.....	Total.....	21	6	2	2		1	1	7	7	6	8		2	9	1	5	6	10
	Male.....	7	2	1	1		1	1	3	3		3		2	2		2	2	4
	Female.....	14	4	1	1				4	4	6	5		2	7		3	4	6
Warrick.....	Total.....	82	11	4	1	3	10	9	7	11	9	15	11	6	12	17	15	15	21
	Male.....	39	6	1	1	1	5	4	4	5	6	5	5	4	7	8	6	10	8
	Female.....	43	5	3	1	2	5	5	3	6	3	10	7	3	5	9	9	5	13
Washington.....	Total.....	58	7	3	2	1	7	5	13	8	11	11	11	5	13	9	10	15	15
	Male.....	31	3	1	1	1	2	3	4	5	3	3	4		5	5	4	8	9
	Female.....	27	4	2	1		5	2	9	3	8	5	7	5	8	4	6	7	6
Wayne.....	Total.....	77	12	6	5	4	2	7	13	14	27	18	30	18	33	33	27	29	44
	Male.....	50	5	2	2	2	1	2	6	13	12	6	13	9	18	22	14	18	14
	Female.....	27	6	3	3	2	1	5	6	7	15	12	17	9	15	11	13	11	30
Wells.....	Total.....	69	14	4	8	1	7	8	10	17	11	11	8	8	7	9	5	20	16
	Male.....	38	9		3	1	6	5	7	12	8	6	5	5	3	6	3	8	4
	Female.....	31	5	4	5		1	6	7	5	3	5	3	3	4	3	2	12	12
White.....	Total.....	40	6	3	1	3	4	5	6	16	5	7	3	7	4	6	11	20	21
	Male.....	24	4	2	1	2	2	2	6	6	2	3	2	3	3	1	7	12	11
	Female.....	16	2	1		1	2	3	5	10	3	4	4	4	1	5	4	8	10

Whitley	Total	37	6	2	2	2	2	3	6	6	6	5	4	3	3	6	5	10	13	15
Male	Male	23	2	.....	2	1	.....	1	3	4	1	4	2	2	1	2	2	5	9	7
Female	Female	14	4	2	.....	1	.....	2	3	2	5	1	2	1	2	4	3	5	4	8
Total males	Total males	4,663	688	285	183	183	111	387	339	523	704	603	562	657	626	707	822	893	1,093	1,234
Total females	Total females	3,614	582	276	168	168	120	380	315	654	900	759	726	711	615	602	644	731	875	1,035
Grand total	Grand total	8,277	1,270	571	351	351	231	777	654	1,177	1,604	1,363	1,288	1,368	1,241	1,309	1,466	1,624	1,968	2,269

TABLE 3.—Continued.

Deaths in Indiana by Months, Counties, Ages, Sex, Color, Nationality and Conjugal Condition, 1905.

COUNTIES.	Sex.	70 to 75.	75 to 80.	80 to 90.	90 and Over.	Unknown.	White.	Colored.	American.	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
Adams	Total	10	16	20	4	...	241	...	206	34	1	122	76	42	1	241
	Male	7	8	11	2	...	121	...	103	17	1	66	36	18	...	121
Allen	Female	3	8	9	2	...	120	...	103	17	...	56	40	23	1	120
	Total	68	67	64	10	1	1,025	9	813	216	5	477	362	190	5	1,034
Allen	Male	31	40	40	4	1	535	6	413	125	3	298	205	74	4	571
	Female	37	27	24	6	...	490	3	370	91	2	189	157	116	1	463
Bartholomew	Total	29	23	29	3	...	326	6	304	26	2	154	107	67	4	332
	Male	12	13	16	1	...	163	3	151	14	1	82	56	28	...	166
Benton	Female	17	10	13	2	...	163	3	153	12	1	72	51	39	4	166
	Total	16	7	5	2	2	143	1	126	14	4	72	47	22	3	144
Benton	Male	8	4	4	1	2	90	...	76	10	4	49	31	7	3	90
	Female	8	3	1	1	...	53	1	50	4	...	23	16	15	...	54
Blackford	Total	15	14	13	...	...	254	...	242	12	...	116	103	35	...	254
	Male	7	9	8	...	...	136	...	130	6	...	69	53	14	...	136
Blackford	Female	8	5	5	...	...	118	...	112	6	...	47	50	21	...	118
	Total	26	25	30	3	...	325	2	317	10	...	149	108	69	1	327
Boone	Male	10	14	14	...	...	157	...	155	4	...	75	61	21	...	159
	Female	16	11	16	3	...	168	2	162	6	...	74	45	48	1	168
Brown	Total	8	14	7	1	2	93	...	88	2	3	33	38	22	...	93
	Male	3	5	2	...	...	45	...	44	...	1	23	16	6	...	45
Brown	Female	5	9	5	1	2	48	...	44	...	2	10	22	16	...	48
	Total	21	14	20	5	...	276	...	243	10	3	117	87	39	13	256
Carroll	Male	16	6	9	2	...	123	...	116	4	3	60	45	13	5	123
	Female	5	8	11	3	...	133	...	127	6	...	57	42	26	8	133

Case	Total	54	50	43	7	576	5	484	64	33	225	212	123	21	581
	Male	20	26	26	3	309	4	257	38	17	134	115	53	11	313
Clark	Female	34	24	17	4	267	1	226	26	16	91	97	70	10	268
	Total	26	24	34	3	397	71	430	31	7	223	163	80	2	468
Clay	Male	17	12	11	1	205	25	146	15	6	135	84	31	1	251
	Female	9	12	23	2	192	1	200	16	1	88	79	49	1	217
Clinton	Total	19	21	19	2	402	5	368	26	3	199	137	68	3	407
	Male	10	10	6	1	190	1	174	19	2	106	78	41	1	194
Crawford	Female	9	11	13	1	212	1	194	17	1	93	85	50	2	213
	Total	29	26	29	5	449	4	438	14	1	191	178	78	3	453
Davies	Male	15	19	14	3	222	1	223	7	1	99	93	28	3	223
	Female	14	7	15	2	227	3	223	7	1	95	85	50	2	230
Dearborn	Total	10	6	12	1	169	.....	159	7	3	88	59	22	.....	169
	Male	7	3	8	1	90	.....	83	5	2	50	30	10	.....	90
Decatur	Female	3	3	4	.....	79	.....	76	2	1	38	29	12	.....	79
	Total	28	23	30	3	431	6	420	14	3	215	125	59	38	437
Dearborn	Male	16	14	18	2	230	1	217	12	2	121	66	22	22	231
	Female	12	9	12	1	201	5	203	2	1	94	59	37	16	206
Decatur	Total	24	35	39	3	331	8	266	64	9	140	113	81	5	339
	Male	12	20	16	3	175	4	140	33	6	85	59	31	4	179
Dekalb	Female	12	15	23	2	156	4	126	31	3	55	54	50	1	160
	Total	17	29	37	3	312	4	295	19	2	124	132	60	.....	316
Delaware	Male	6	14	25	3	165	2	146	10	1	68	76	23	.....	167
	Female	11	15	12	.....	147	2	139	9	1	56	56	37	.....	149
Dubois	Total	20	24	33	4	314	2	294	21	1	129	121	61	2	316
	Male	9	13	16	1	173	2	161	13	1	78	73	22	2	175
Duluth	Female	11	11	17	3	141	.....	133	8	.....	51	48	42	.....	141
	Total	42	33	40	13	714	19	692	38	3	371	257	101	1	733
Duluth	Male	24	19	21	8	391	9	375	22	3	213	143	43	1	400
	Female	18	14	19	5	323	10	317	16	.....	158	114	61	.....	333
Elkhart	Total	14	20	17	1	280	.....	277	50	3	133	91	56	.....	280
	Male	5	11	8	1	134	.....	107	27	.....	69	44	21	.....	134
Elkhart	Female	9	9	9	.....	146	.....	120	23	3	61	47	35	.....	146
	Total	54	57	48	8	619	1	554	53	13	229	232	147	12	620
Elkhart	Male	24	30	25	5	310	.....	275	28	8	115	115	58	10	311
	Female	30	27	23	3	309	.....	279	25	5	101	117	89	2	309

TABLE 3.—Continued.

Deaths in Indiana by Months, Counties, Ages, Sex, Color, Nationality and Conjugal Condition, 1905.

COUNTIES.	Sex.	70 to 75.	75 to 80.	80 to 90.	90 and Over.	Unknown.	White.	Colored.	American.	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
Adams	Total	10	16	20	4	.....	241	.....	206	34	1	122	76	42	1	241
	Male	7	8	11	2	.....	121	.....	103	17	.....	66	36	19	.....	121
Allen	Female	3	8	9	2	.....	120	.....	103	17	.....	56	40	23	1	120
	Total	68	67	64	10	1	1,025	9	813	216	5	477	362	190	5	1,034
Bartholomew	Male	31	40	40	4	1	535	6	413	125	3	298	205	74	4	571
	Female	37	27	24	6	.....	480	3	370	91	2	189	157	116	1	463
Bartholomew	Total	29	23	29	3	.....	326	6	304	26	2	154	107	67	4	332
	Male	12	13	16	1	.....	163	3	151	14	2	82	56	28	4	166
Benton	Female	17	10	13	2	.....	163	3	153	12	1	72	51	39	4	166
	Total	16	7	5	2	2	143	1	126	14	4	72	47	22	3	144
Blackford	Male	8	4	4	1	2	90	.....	76	10	4	49	31	7	3	90
	Female	8	3	1	1	.....	53	1	50	4	.....	23	16	15	.....	54
Boone	Total	15	14	13	.....	.....	254	.....	242	12	.....	116	103	35	.....	254
	Male	7	9	8	.....	.....	136	.....	130	6	.....	69	53	14	.....	136
Boone	Female	8	5	5	.....	.....	118	.....	112	6	.....	47	50	21	.....	118
	Total	26	25	30	3	.....	325	2	317	10	.....	149	108	69	1	327
Brown	Male	10	14	14	3	.....	157	2	155	4	.....	75	53	21	.....	159
	Female	16	11	16	.....	.....	168	.....	162	6	.....	74	45	48	1	168
Brown	Total	8	14	7	1	2	93	.....	88	2	3	33	38	22	.....	93
	Male	3	5	2	.....	.....	45	.....	44	.....	.....	23	16	6	.....	45
Carroll	Female	5	9	5	1	2	48	.....	44	2	2	10	22	16	.....	48
	Total	21	14	20	5	.....	276	.....	243	10	3	117	87	39	13	256
Carroll	Male	16	9	9	2	.....	124	.....	116	4	3	60	45	13	5	123
	Female	5	8	11	3	.....	133	.....	127	6	.....	57	42	26	8	133

Case	Total	54	50	43	7	7	576	5	484	64	33	225	212	123	21	581
	Male	20	26	26	3	3	309	4	257	38	17	134	115	53	11	313
	Female	34	24	17	4	4	267	1	226	26	16	91	97	70	10	268
Clark	Total	26	24	31	3	2	397	71	430	31	7	223	163	80	2	468
	Male	17	12	11	1	1	205	46	230	15	6	135	84	31	1	251
	Female	9	12	23	2	1	192	25	200	16	1	88	79	49	1	217
Clay	Total	19	21	19	2	2	402	5	368	26	3	199	137	68	3	407
	Male	10	10	6	1	1	190	4	174	19	2	106	69	27	2	194
	Female	9	11	13	1	1	212	1	194	17	1	93	78	41	1	213
Clinton	Total	29	26	29	5	1	449	4	438	14	1	191	178	78	3	453
	Male	15	14	14	3	1	222	1	223	7	1	93	93	28	3	223
	Female	14	7	15	2	.....	227	3	223	7	.....	95	85	50	.....	220
Crawford	Total	10	6	12	1	4	169	.....	159	7	3	88	59	22	.....	169
	Male	7	3	8	1	1	90	.....	83	5	2	50	30	10	.....	90
	Female	3	3	4	.....	3	79	.....	76	2	1	38	29	12	.....	79
Davies	Total	28	23	30	3	1	431	6	420	14	3	215	125	59	38	437
	Male	16	14	18	2	.....	230	1	217	12	2	121	66	22	22	231
	Female	12	9	12	1	1	201	5	203	2	1	94	59	37	16	206
Dearborn	Total	24	35	39	3	5	331	8	265	64	9	140	113	81	5	339
	Male	12	20	16	3	3	175	4	140	31	3	85	59	31	4	179
	Female	12	15	23	.....	2	156	.....	125	31	.....	55	54	50	1	160
Decatur	Total	17	29	37	3	.....	312	4	295	19	2	124	132	60	.....	316
	Male	6	14	25	3	.....	165	2	146	10	1	68	76	23	.....	167
	Female	11	15	12	.....	.....	147	.....	139	9	.....	56	56	37	.....	149
Dekalb	Total	20	24	33	4	1	314	2	294	21	1	129	121	61	2	316
	Male	9	13	16	1	1	173	2	161	13	1	78	73	22	2	175
	Female	11	11	17	3	.....	141	.....	133	8	.....	51	48	42	.....	141
Delaware	Total	42	33	40	13	3	714	19	692	38	3	371	257	101	1	733
	Male	24	19	21	8	2	391	9	375	22	3	213	143	43	1	400
	Female	18	14	19	5	1	323	10	317	16	.....	158	114	61	.....	333
Dubois	Total	14	20	17	1	.....	280	.....	227	50	3	133	91	56	.....	280
	Male	5	11	8	1	.....	134	.....	107	27	.....	69	44	21	.....	134
	Female	9	9	9	.....	.....	146	.....	120	23	3	61	47	35	.....	146
Elkhart	Total	54	57	48	8	.....	619	1	554	53	13	229	232	147	12	620
	Male	24	30	25	5	.....	310	1	275	28	8	128	115	58	10	311
	Female	30	27	23	3	.....	309	.....	279	25	5	101	117	89	2	309

TABLE 3.—Continued.

COUNTIES.	Sex.		70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
Fayette.....	Total.....	15	12	13	13	2	2	168	8	165	11	.....	79	48	23	26	176
	Male.....	10	3	5	5	.....	2	73	4	4	7	.....	38	17	9	13	77
	Female.....	5	9	8	8	.....	2	95	4	92	4	.....	41	31	14	13	99
Floyd.....	Total.....	33	29	32	32	6	2	420	59	403	75	1	203	157	117	2	479
	Male.....	14	13	21	21	1	.....	208	32	196	44	.....	105	91	43	2	240
	Female.....	19	16	11	11	5	2	212	27	207	31	1	98	66	74	1	239
Fountain.....	Total.....	14	24	21	21	2	1	259	.....	250	8	1	106	102	50	1	259
	Male.....	5	8	9	9	1	1	135	.....	129	5	1	61	58	16	.....	135
	Female.....	9	16	12	12	1	.....	124	.....	121	3	.....	45	44	34	1	124
Franklin.....	Total.....	17	15	24	24	4	1	200	3	189	33	1	83	82	38	.....	203
	Male.....	7	10	12	12	2	.....	98	2	81	19	.....	36	44	20	.....	100
	Female.....	10	5	12	12	2	1	102	1	88	14	1	47	38	18	.....	103
Fulton.....	Total.....	18	25	13	13	1	1	239	3	225	17	.....	104	85	52	1	242
	Male.....	6	17	7	7	.....	.....	122	2	116	8	.....	63	41	19	1	124
	Female.....	12	8	6	6	1	1	117	1	109	9	.....	41	44	33	.....	113
Gibson.....	Total.....	21	24	16	16	5	1	408	23	403	29	4	217	156	60	3	436
	Male.....	13	9	11	11	.....	.....	235	9	194	17	3	112	84	16	2	214
	Female.....	8	15	5	5	5	1	203	19	209	12	1	105	72	44	1	222
Grant.....	Total.....	61	54	43	43	10	3	838	40	816	56	6	405	307	164	2	878
	Male.....	42	35	22	22	4	2	472	26	450	43	5	247	159	91	1	468
	Female.....	19	19	21	21	6	1	366	14	366	13	1	158	148	73	1	360
Greene.....	Total.....	32	27	22	22	3	2	493	3	469	24	3	239	171	65	1	496
	Male.....	16	17	10	10	1	2	252	2	236	17	1	137	90	27	.....	254
	Female.....	16	10	12	12	2	.....	241	1	233	7	2	122	81	38	1	242
Hamilton.....	Total.....	36	24	38	38	6	.....	378	13	366	5	.....	145	151	89	6	391
	Male.....	17	14	16	16	4	.....	186	6	189	2	.....	78	76	34	3	191
	Female.....	19	10	22	22	2	.....	192	8	177	3	.....	67	75	55	3	200

Hancock	Total	32	23	19	2	.....	313	1	298	15	1	144	115	52	3	314
	Male	18	10	11	1	.....	162	.....	154	8	.....	83	63	16	.....	162
	Female	14	13	8	1	.....	151	1	144	7	1	61	52	36	3	152
Harrison	Total	14	23	20	2	5	273	8	258	18	5	123	105	49	4	281
	Male	9	21	9	1	2	147	6	138	10	5	68	54	27	4	163
	Female	5	7	11	1	3	126	2	120	8	.....	55	51	22	.....	128
Hendricks	Total	19	14	20	6	2	260	1	249	10	2	104	101	56	.....	261
	Male	12	7	11	4	1	136	1	129	6	1	58	58	20	.....	136
	Female	7	7	9	2	1	125	.....	120	4	1	46	43	36	.....	125
Henry	Total	27	35	26	4	.....	337	12	339	8	3	148	134	67	1	350
	Male	8	22	14	3	.....	174	5	171	5	3	84	67	27	1	179
	Female	19	14	12	1	.....	163	8	168	3	.....	64	67	40	.....	171
Howard	Total	33	21	32	5	.....	400	14	395	18	1	184	145	77	8	414
	Male	11	12	16	.....	.....	213	9	213	9	.....	107	80	23	7	232
	Female	22	9	16	5	.....	187	5	182	9	1	77	66	49	1	182
Huntington	Total	18	20	21	4	2	332	.....	308	23	1	135	125	64	12	332
	Male	4	11	11	1	2	132	.....	163	16	.....	75	62	25	10	170
	Female	14	9	10	3	.....	153	.....	145	7	1	60	56	35	2	153
Jackson	Total	35	9	19	2	3	409	8	388	23	1	239	123	57	3	412
	Male	21	3	10	.....	3	210	2	196	15	1	133	51	26	3	212
	Female	14	6	9	2	.....	199	1	192	8	.....	96	72	32	.....	200
Jasper	Total	6	12	15	1	2	125	.....	106	18	1	52	44	28	1	125
	Male	3	7	9	.....	1	72	.....	60	11	1	32	27	12	1	72
	Female	3	5	6	1	1	53	.....	46	7	.....	20	17	16	.....	53
Jay	Total	12	18	26	3	1	376	2	365	9	4	184	138	54	2	378
	Male	10	16	12	2	.....	183	2	177	5	3	94	67	31	1	185
	Female	2	2	14	1	1	193	.....	188	4	1	90	71	23	1	193
Jefferson	Total	25	29	43	4	4	327	20	315	30	2	159	119	69	.....	347
	Male	14	12	20	2	1	158	13	158	11	2	88	61	22	.....	171
	Female	11	17	23	2	3	169	7	157	19	.....	71	58	47	.....	176
Jennings	Total	28	16	19	4	.....	219	7	202	22	2	81	90	53	2	228
	Male	18	6	8	2	.....	116	4	107	11	2	50	51	17	2	120
	Female	8	10	11	2	.....	103	3	95	11	.....	31	39	36	.....	106
Johnson	Total	18	18	22	2	.....	255	5	252	5	3	112	95	51	2	260
	Male	10	8	9	.....	.....	126	2	123	3	2	62	49	15	2	128
	Female	8	10	13	2	.....	129	3	129	2	1	50	46	36	.....	132

TABLE 3.—Continued.

COUNTIES.	Sex.		70 to 75.	75 to 80.	80 to 90.	90 and Over.	Unknown.	White.	Colored.	American.	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
Knox.....	Total.....	29	22	23	23	5	.....	541	7	494	49	5	302	157	86	3	548
	Male.....	16	13	13	10	4	.....	273	3	214	27	5	167	78	28	3	276
	Female.....	13	9	10	4	.....	.....	268	4	250	22	.....	135	79	58	.....	272
Kosciusko.....	Total.....	34	32	33	33	4	.....	367	2	342	24	3	149	143	74	3	369
	Male.....	19	18	16	16	2	.....	183	2	169	19	2	85	78	26	1	190
	Female.....	15	14	17	2	.....	.....	179	.....	173	5	1	64	65	48	2	179
Lagrange.....	Total.....	20	14	21	21	3	.....	221	.....	209	11	1	79	89	53	.....	221
	Male.....	12	5	10	1	.....	.....	124	.....	116	8	.....	31	48	16	.....	124
	Female.....	8	9	11	2	.....	.....	97	.....	93	3	1	.....	29	37	.....	97
Lake.....	Total.....	29	21	41	4	4	6	638	1	444	184	11	356	185	80	18	639
	Male.....	19	13	28	.....	4	5	383	.....	256	120	8	216	105	46	17	384
	Female.....	10	8	13	.....	.....	1	255	.....	188	64	3	140	80	34	1	255
Laporte.....	Total.....	41	30	54	9	2	2	565	6	397	169	5	241	195	121	14	571
	Male.....	21	14	22	2	.....	.....	293	5	214	82	2	138	107	43	10	298
	Female.....	20	16	32	7	.....	.....	272	1	183	87	3	103	88	78	4	273
Lawrence.....	Total.....	29	21	21	5	3	3	417	7	411	12	1	226	122	72	4	424
	Male.....	12	13	13	5	2	1	217	5	212	10	.....	130	64	25	3	222
	Female.....	17	8	8	.....	.....	.....	200	2	199	2	1	96	58	47	1	202
Madison.....	Total.....	44	45	37	8	1	1	865	14	826	45	8	451	284	134	10	879
	Male.....	23	25	20	5	1	1	478	6	449	28	7	263	150	62	9	484
	Female.....	21	20	17	3	.....	.....	387	8	377	17	1	188	134	72	1	395
Marion.....	Total.....	203	174	175	27	37	37	3,188	496	3,130	490	64	1,562	1,329	681	92	3,694
	Male.....	106	90	74	12	21	21	1,713	253	1,672	259	35	901	751	247	67	1,966
	Female.....	97	84	97	15	16	16	1,475	213	1,458	231	29	681	578	434	25	1,718
Marshall.....	Total.....	31	20	35	1	2	2	269	.....	256	30	3	91	101	69	8	269
	Male.....	18	11	13	1	.....	.....	127	.....	106	17	2	41	56	23	7	127
	Female.....	13	9	22	.....	.....	.....	142	.....	128	13	1	50	45	46	1	142

Martin.....	Total.....	9	11	8	.....	1	177	1	173	5	.....	86	76	16	.....	178
	Male.....	6	5	6	.....	1	89	.....	86	3	.....	46	41	3	.....	89
	Female.....	3	6	2	.....	.....	88	.....	87	2	.....	41	35	13	.....	89
Miami.....	Total.....	18	27	34	7	.....	352	2	324	28	2	148	123	83	.....	354
	Male.....	12	18	17	4	.....	199	2	186	15	.....	93	72	34	.....	201
	Female.....	6	9	17	3	.....	153	.....	138	13	2	55	51	47	.....	153
Monroe.....	Total.....	19	20	21	4	.....	318	8	311	11	4	166	115	44	1	326
	Male.....	14	11	11	2	.....	165	5	163	6	1	87	64	19	.....	170
	Female.....	5	9	10	2	.....	153	3	148	5	3	79	51	25	1	156
Montgomery.....	Total.....	42	35	45	4	.....	420	8	415	13	.....	186	170	96	6	428
	Male.....	28	17	23	1	.....	202	6	202	6	.....	80	90	33	5	208
	Female.....	16	18	22	3	.....	218	2	213	7	.....	76	80	63	1	220
Morgan.....	Total.....	29	24	18	5	2	311	.....	300	9	2	123	139	45	4	311
	Male.....	19	11	11	1	1	165	.....	158	6	1	66	82	14	3	165
	Female.....	10	13	7	4	1	146	.....	142	3	1	57	57	31	1	146
Newton.....	Total.....	8	.....	10	2	.....	113	.....	101	11	1	59	38	15	1	113
	Male.....	2	.....	5	2	.....	72	.....	65	6	1	41	26	4	1	72
	Female.....	6	.....	5	.....	.....	41	.....	36	5	.....	18	12	11	.....	41
Noble.....	Total.....	24	30	31	3	1	209	.....	237	32	.....	92	119	57	1	209
	Male.....	17	15	12	2	1	142	.....	124	18	.....	51	69	21	1	142
	Female.....	7	16	19	1	.....	127	.....	113	14	.....	41	50	36	.....	127
Ohio.....	Total.....	4	4	7	.....	.....	55	5	57	3	.....	23	22	15	.....	60
	Male.....	1	1	3	.....	.....	28	1	28	1	.....	13	8	8	.....	29
	Female.....	3	3	4	.....	.....	27	4	29	2	.....	10	14	7	.....	31
Orange.....	Total.....	10	15	10	1	4	216	2	213	8	2	108	50	28	2	218
	Male.....	5	6	5	.....	.....	104	2	102	3	1	56	39	9	2	106
	Female.....	5	9	5	1	2	112	.....	111	.....	.....	52	41	19	.....	112
Owen.....	Total.....	13	15	5	3	1	170	4	171	8	.....	62	73	89	.....	174
	Male.....	6	10	2	2	.....	87	4	80	1	.....	32	39	20	.....	81
	Female.....	7	5	3	1	.....	83	.....	81	2	.....	30	34	19	.....	83
Parke.....	Total.....	23	23	18	2	3	320	8	308	16	4	142	130	54	2	328
	Male.....	14	12	.....	.....	.....	186	4	186	16	4	90	63	16	1	170
	Female.....	11	11	10	2	.....	154	4	152	6	.....	52	67	38	1	158
Perry.....	Total.....	13	18	20	4	5	259	8	217	49	1	108	96	60	3	267
	Male.....	7	12	12	2	4	122	3	104	21	.....	55	48	21	1	125
	Female.....	6	11	8	2	1	137	5	113	28	.....	53	48	39	2	142

TABLE 3.—Continued.

COUNTIES.	Sex.		70 to 75.	75 to 80.	80 to 90.	90 and over.	Unknown.	White.	Colored.	American.	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
Pike.....	Total.....	17	17	13	2	2	2	322	4	311	14	1	173	107	44	2	325
	Male.....	12	12	6	2	2	1	154	3	148	8	1	86	58	13	.....	157
Porter.....	Female.....	5	7	7	.....	.....	1	168	1	163	6	.....	87	49	31	2	169
	Total.....	21	21	26	1	1	1	259	.....	193	62	4	106	93	54	6	259
Posey.....	Male.....	10	10	10	1	1	1	142	.....	102	38	2	66	49	23	5	142
	Female.....	11	11	11	.....	.....	.....	117	.....	91	24	2	41	44	31	1	117
Pulaski.....	Total.....	14	16	17	2	2	2	297	22	292	24	3	167	106	44	2	319
	Male.....	9	10	10	1	1	1	154	9	144	16	3	95	49	18	1	163
Putnam.....	Female.....	5	6	7	1	1	1	143	13	148	8	.....	72	57	26	1	156
	Total.....	5	9	12	6	6	.....	127	1	93	29	6	55	48	25	.....	128
Randolph.....	Male.....	3	3	3	.....	.....	.....	72	1	51	21	1	33	27	13	.....	73
	Female.....	2	6	2	1	.....	.....	55	.....	42	8	5	22	21	12	.....	56
Ripley.....	Total.....	25	21	26	4	4	1	280	3	277	5	1	114	109	58	2	283
	Male.....	14	10	11	3	3	1	135	.....	131	3	1	55	62	17	1	135
Rush.....	Female.....	11	11	15	1	.....	.....	145	3	146	2	.....	59	47	41	1	148
	Total.....	25	32	37	5	5	1	382	7	371	18	.....	165	153	70	1	389
Scott.....	Male.....	10	17	25	2	2	1	190	6	187	9	.....	85	84	27	.....	196
	Female.....	15	15	12	3	.....	.....	192	1	184	9	.....	80	69	43	1	193
Sevier.....	Total.....	17	24	29	3	3	1	257	3	210	49	1	102	98	59	1	260
	Male.....	7	12	15	2	2	1	127	3	105	24	1	62	50	17	1	130
Shelby.....	Female.....	10	12	14	1	.....	.....	130	.....	105	25	.....	40	48	42	.....	130
	Total.....	16	20	17	5	5	1	215	11	218	8	.....	90	94	39	3	226
Union.....	Male.....	6	11	12	3	.....	.....	119	8	122	5	.....	52	58	16	1	127
	Female.....	10	9	5	2	2	1	96	3	96	3	.....	38	36	23	2	99
Van Buren.....	Total.....	13	9	9	3	3	1	127	.....	125	2	.....	52	51	24	.....	127
	Male.....	6	7	5	3	3	1	60	.....	58	2	.....	18	18	32	1	60
Washington.....	Female.....	7	2	4	.....	.....	.....	67	.....	67	.....	.....	34	19	14	.....	67

Shelby.....	Total.....	21	33	25	8	3	352	18	353	16	1	156	187	72	5	370
Male.....	.....	9	14	9	4	1	164	9	163	10	...	84	63	23	3	173
Female.....	.....	12	19	16	4	2	188	9	190	6	1	72	74	49	2	197
Spencer.....	Total.....	19	20	20	2	4	255	22	246	30	1	121	96	59	1	277
Male.....	.....	11	9	12	1	2	133	8	122	11	...	76	43	16	1	141
Female.....	.....	8	11	8	1	2	122	14	124	11	1	45	43	43	...	136
Starke.....	Total.....	10	10	15	1	1	147	...	124	23	...	69	51	27	...	147
Male.....	.....	6	9	7	1	...	80	...	65	13	...	41	28	13	...	80
Female.....	.....	4	1	8	...	...	67	...	59	8	...	28	25	14	...	67
Steuben.....	Total.....	28	23	19	2	1	205	...	188	14	3	66	83	55	1	205
Male.....	.....	14	13	11	1	...	113	...	102	9	2	45	45	22	1	113
Female.....	.....	14	10	8	1	...	92	...	86	5	1	21	38	33	...	92
St. Joseph.....	Total.....	53	56	58	13	1	1,068	18	882	103	13	592	329	156	9	1,066
Male.....	.....	25	25	25	6	1	567	8	452	103	10	323	173	61	5	565
Female.....	.....	28	31	33	7	...	511	10	430	88	3	266	156	95	4	521
Sullivan.....	Total.....	27	24	28	3	2	457	8	447	8	10	250	141	70	4	465
Male.....	.....	16	10	10	1	1	232	7	228	5	6	137	81	18	3	239
Female.....	.....	11	14	16	2	1	225	1	219	3	4	113	60	52	1	226
Switzerland.....	Total.....	11	13	14	4	1	141	1	133	9	...	53	65	23	1	142
Male.....	.....	4	9	8	3	1	70	...	72	7	...	28	42	9	...	79
Female.....	.....	7	4	6	1	...	62	1	61	2	...	25	23	14	1	63
Tippecanoe.....	Total.....	68	38	46	12	2	621	11	514	113	5	215	239	168	10	632
Male.....	.....	36	21	25	6	2	353	3	292	62	2	139	131	79	8	356
Female.....	.....	32	17	21	6	...	268	8	222	51	3	77	108	89	2	276
Tipton.....	Total.....	14	12	12	2	4	234	...	220	10	4	109	91	32	2	234
Male.....	.....	7	8	7	1	2	115	...	108	5	2	58	42	14	1	115
Female.....	.....	7	4	5	1	2	119	...	112	5	2	51	49	18	1	119
Union.....	Total.....	10	9	16	4	...	85	...	78	7	...	28	26	31	...	85
Male.....	.....	7	6	7	1	...	46	...	45	3	...	16	18	14	...	48
Female.....	.....	3	3	9	3	...	37	...	33	4	...	12	8	17	...	37
Vanderburgh.....	Total.....	53	39	51	7	5	977	184	948	198	15	577	358	212	14	1,161
Male.....	.....	29	18	24	5	4	520	96	514	100	6	333	203	74	9	619
Female.....	.....	24	21	27	2	1	457	88	434	98	10	244	155	138	5	542
Vermillion.....	Total.....	10	19	8	1	7	256	2	243	13	2	135	85	36	2	258
Male.....	.....	6	17	2	...	4	127	1	116	10	2	71	40	15	2	125
Female.....	.....	4	12	6	1	3	129	1	127	3	...	64	45	21	...	130

TABLE 3.—Continued.

COUNTIES.	Sex.	70 to 75.	75 to 80.	80 to 90.	90 and Over.	Unknown.	White.	Colored.	American.	Foreign.	N. R.	Single.	Married.	Widowed.	N. R.	Total.
Vigo.....	Total.....	50	47	45	7	6	1,042	76	971	135	12	576	327	198	17	1,118
	Male.....	25	25	15	4	4	566	42	524	76	8	345	176	72	15	608
	Female.....	25	22	30	3	2	476	34	447	58	4	231	151	126	2	510
Wabash.....	Total.....	27	17	26	6	.....	317	4	299	19	3	137	113	69	2	321
	Male.....	15	7	10	4	.....	161	3	149	13	2	74	63	26	1	164
	Female.....	12	10	16	2	.....	156	1	150	6	1	63	50	43	1	157
Warren.....	Total.....	10	8	15	1	1	133	.....	128	3	2	46	53	33	1	133
	Male.....	5	5	8	1	1	55	.....	53	1	1	21	22	12	.....	55
	Female.....	5	3	7	.....	.....	78	.....	75	2	1	25	31	21	1	78
Warrick.....	Total.....	12	14	18	.....	2	290	18	278	27	3	148	108	50	2	308
	Male.....	8	4	9	.....	1	135	9	126	16	2	73	43	14	2	144
	Female.....	4	10	9	3	1	155	9	152	11	1	75	55	34	.....	164
Washington.....	Total.....	22	19	21	1	3	269	1	266	2	2	119	96	51	4	270
	Male.....	12	12	7	.....	2	126	1	124	1	2	60	45	19	4	127
	Female.....	10	7	14	1	1	143	.....	142	1	.....	59	51	32	.....	143
Wayne.....	Total.....	48	62	56	13	1	541	37	510	65	3	185	242	150	1	578
	Male.....	27	33	33	5	.....	282	19	262	36	3	165	138	57	1	301
	Female.....	21	29	23	8	1	259	18	248	29	.....	80	104	93	.....	277
Wells.....	Total.....	18	13	22	2	.....	238	.....	271	14	3	139	108	41	.....	288
	Male.....	8	6	13	1	.....	137	.....	127	8	2	73	49	15	.....	137
	Female.....	9	7	9	1	.....	151	.....	144	6	1	66	59	26	.....	151
White.....	Total.....	19	20	16	2	.....	227	1	208	20	.....	86	92	49	1	228
	Male.....	9	13	9	1	.....	118	1	108	11	.....	48	54	16	.....	119
	Female.....	10	7	7	1	.....	109	.....	100	9	.....	38	38	33	.....	109

Whitley	Total.....	7	27	21	.....	188	1	174	15	.....	81	57	50	1	189
	Male.....	2	16	13	.....	89	1	90	10	.....	45	29	26	.....	100
	Female.....	5	11	8	.....	89	.....	84	5	.....	36	28	24	1	89
Total males.....		1,258	1,220	1,252	182	111	754	16,856	1,990	918	9,254	6,919	2,574	317	19,084
Total females.....		1,151	1,079	1,224	203	74	632	15,738	1,312	138	7,174	5,964	4,156	144	17,438
Grand total		2,409	2,299	2,476	385	185	1,406	32,514	3,332	356	16,428	12,883	6,730	461	36,502

TABLE No. 4.

Deaths in Indiana by Counties, for the Year 1905.

STATE AND COUNTIES.	Population, Estimated According to U. S. Census Bureau.	Total Deaths Reported for the Year 1905.	Annual Death Rate per 1,000 Population.	Stillbirths.	IMPORTANT AGES.						DEATHS FROM IMPORTANT CAUSES.																
					Under 1 year.	1 to 4 inclusive.	5 to 9 inclusive.	10 to 14 inclusive.	15 to 19 inclusive.	65 Years and over.	Pulmonary Consumption.	Other forms of Tuberculosis.	Typhoid Fever.	Diphtheria.	Croup.	Scarlet Fever.	Measles.	Whooping Cough.	Pneumonia.	Diarrheal Diseases under 5.	Cerebro-spinal Meningitis.	Influenza.	Puerteral Septicæmia.	Cancer.	Violence.	Smallpox.	
State of Indiana ..	2,648,549	36,502	13.7	9,236	8,277	2,423	777	654	1,177	9,838	3,098	494	928	328	98	133	6	136	3,604	1,700	460	591	178	1,424	2,050	35	
Northern Counties ..	887,832	11,471	12.9	722	2,690	707	232	202	330	3,308	1,003	127	281	94	13	35	3	35	1,079	585	155	163	54	538	707	9	
Adams	23,052	241	10.4	20	61	19	13	3	8	62	23	4	8	3	1	2	...	...	22	7	5	7	1	11	12	1
Allen	81,502	1,034	12.6	68	232	45	16	24	37	277	98	12	10	6	3	1	...	...	95	41	11	4	3	59	76	...
Benton	13,611	144	10.5	12	40	12	5	2	3	46	9	1	2	1	...	...	...	...	14	8	1	1	1	7	10	...
Blackford	19,914	251	12.7	25	68	12	8	5	5	55	26	6	6	8	...	...	...	...	20	8	9	3	2	6	13	...
Carroll	19,953	256	12.8	21	64	17	3	5	10	72	25	2	12	1	...	...	...	...	31	6	5	3	2	6	16	...
Cass	35,902	581	16.1	27	93	34	15	4	11	183	41	8	16	2	...	...	...	...	65	30	4	13	2	18	38	...
DeKalb	26,272	316	12.0	20	72	17	8	4	11	100	30	5	10	6	4	29	5	4	8	2	22	24	...
Elkhart	47,392	620	13.0	26	116	30	7	7	16	224	59	10	16	4	...	...	...	...	54	19	9	9	4	36	30	1
Fulton	17,786	242	13.6	15	54	18	3	3	6	75	16	2	4	1	...	...	...	...	23	29	9	4	1	18	9	...
Grant	63,973	878	13.7	71	221	48	17	20	34	230	92	11	24	3	3	3	...	...	95	38	8	15	1	22	26	...
Howard	29,531	414	14.0	41	107	20	7	12	17	115	42	3	4	2	1	...	...	...	43	11	7	8	3	27	29	...
Huntington	29,404	332	11.2	27	70	19	6	5	6	90	30	2	12	2	...	...	...	...	47	19	7	4	1	18	30	...
Jasper	15,535	125	8.0	4	29	9	1	2	4	43	13	...	...	...	...	...	...	...	18	6	2	2	1	8	6	...
Jay	28,154	378	13.4	23	101	37	6	7	11	88	45	3	10	...	...	...	...	...	35	44	6	8	1	18	13	...
Kosciusko	29,265	369	12.5	18	76	26	4	10	3	131	18	2	13	1	...	...	...	...	34	17	4	5	2	23	14	...
Lagrange	15,294	221	14.4	12	40	11	4	3	4	75	17	6	6	1	...	...	...	...	13	12	4	8	3	9	15	...
Lake	43,494	539	14.6	38	197	51	17	12	13	117	26	7	16	14	3	...	...	...	74	40	10	7	6	21	79	1
Laporte	39,952	571	14.2	20	121	39	12	5	19	169	33	6	11	9	1	4	...	...	53	31	14	2	...	36	96	...
Marshall	25,639	266	10.4	16	49	10	6	5	8	102	19	1	11	...	...	...	...	...	25	9	1	3	...	20	19	...

Miami.....	29,352	354	12.0	12	80	24	4	3	14	119	25	1	11	1	1	2	36	24	11	9	1	12	16
Newble.....	11,106	113	10.1	17	31	11	5	1	3	27	9	1	5	1	1	1	11	10	10	1	10	6	
Noble.....	28,603	269	11.3	17	48	12	5	2	8	108	21	1	3	1	1	2	222	6	3	4	16	20	
Porter.....	19,624	259	13.1	7	52	10	7	6	6	87	18	2	5	1	2	2	38	11	1	1	16	20	
Pulaski.....	15,153	128	8.4	5	23	13	3	1	4	42	14	6	3	2	2	20	7	7	2	5	10	4	
Starke.....	11,668	147	12.5	10	37	16	3	3	4	44	16	1	6	3	7	18	7	7	3	2	2	11	
Steuben.....	15,415	206	13.2	6	82	8	4	6	25	84	17	4	4	4	7	7	7	98	10	5	15	13	
St. Joseph.....	65,451	1,066	16.5	93	365	65	24	21	25	226	108	19	7	6	5	81	81	10	7	6	42	64	
Wabash.....	28,679	321	11.1	18	65	23	7	2	8	98	39	5	5	6	1	20	20	10	7	3	14	24	
Wells.....	24,223	288	11.8	21	69	10	7	5	10	71	31	3	2	2	2	32	32	21	1	3	12	23	
White.....	20,525	228	11.1	10	40	13	4	5	6	78	16	12	9	2	1	18	18	4	3	2	12	15	
Whitley.....	17,328	189	10.9	13	37	12	3	6	6	70	13	2	9	1	1	14	14	7	3	1	8	9	
Central Counties.....	1,087,620	15,311	14.0	950	3,312	906	308	258	494	4,168	1,735	224	347	109	8	45	3	59	1,508	632	164	237	827
Bartholomew.....	24,985	332	13.3	19	81	20	14	4	7	113	53	9	9	1	1	1	36	21	6	8	2	22	9
Boone.....	26,521	327	12.4	25	74	19	9	10	10	101	47	5	7	3	1	3	26	12	5	8	2	15	14
Brown.....	9,727	93	9.5	7	14	6	2	3	3	34	14	3	3	1	1	8	8	4	5	4	3	4	
Clay.....	35,785	407	11.3	13	101	35	15	7	18	86	45	2	10	2	1	4	27	29	5	4	9	17	
Clinton.....	28,535	453	15.8	31	109	23	9	9	14	123	69	4	11	1	1	4	43	12	4	10	2	17	
Decatur.....	19,614	316	16.1	26	66	14	5	1	6	106	34	4	5	3	2	2	27	10	8	12	1	16	
Delaware.....	67,421	733	12.7	48	191	47	25	15	27	154	83	15	23	13	1	1	69	30	8	11	3	21	
Fayette.....	13,541	176	12.7	11	36	10	5	2	6	49	28	3	2	1	1	1	22	6	6	8	1	6	
Fountain.....	22,201	259	11.6	20	58	17	5	3	6	78	24	3	7	1	4	1	20	11	3	10	1	7	
Franklin.....	16,368	203	12.3	12	48	6	2	3	7	69	28	3	2	1	1	1	21	9	2	5	1	7	
Hamilton.....	31,430	391	12.4	23	77	29	7	6	11	133	47	6	15	2	1	1	83	20	2	10	1	13	
Hancock.....	19,755	314	15.8	25	80	20	6	7	9	96	32	5	3	3	1	1	38	20	5	4	1	10	
Hendricks.....	21,292	261	12.2	24	54	12	7	7	12	78	36	1	3	1	1	1	23	7	2	5	1	9	
Henry.....	25,572	350	13.6	22	77	13	9	4	11	110	37	1	12	2	1	1	19	12	10	5	2	16	
Johnson.....	20,468	260	12.6	20	53	13	7	5	8	74	17	1	2	1	1	1	30	11	3	1	9	11	
Madison.....	84,063	879	10.4	74	263	69	20	19	32	179	80	13	34	7	1	1	57	62	14	10	6	32	
Marion.....	219,695	3,684	16.7	241	738	185	44	64	114	827	425	61	18	24	1	10	391	103	32	38	10	118	
Monroe.....	22,133	326	14.7	24	73	27	13	5	6	96	43	5	5	6	1	1	83	23	3	3	3	25	
Montgomery.....	25,933	428	14.8	27	87	14	15	5	14	156	56	1	1	1	1	4	38	20	1	8	2	12	
Morgan.....	21,183	311	14.6	9	51	18	5	6	14	98	36	4	1	1	1	4	45	12	1	1	13	11	
Owen.....	15,193	174	11.4	1	26	10	5	4	2	49	28	4	4	1	1	1	26	7	2	1	1	8	
Parke.....	24,082	328	13.6	20	44	31	5	5	10	80	36	9	8	1	1	1	43	15	1	3	1	18	
Putnam.....	21,478	283	13.1	16	52	20	9	4	14	90	41	4	8	1	1	1	46	5	2	4	1	11	
Randolph.....	24,860	289	13.4	18	54	15	6	8	13	135	45	6	9	1	1	1	33	28	4	5	1	12	
Rush.....	20,394	226	10.9	8	43	11	5	3	3	78	21	6	3	1	1	2	30	13	3	5	1	12	

TABLE No. 4.—Continued.

STATE AND COUNTRIES.	Population, Estimated According to U. S. Census Bureau.	Total Deaths Reported for the Year 1905.	Annual Death Rate per 1,000 Population.	Stillbirths.	IMPORTANT AGES.						DEATHS FROM IMPORTANT CAUSES.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
					Under 1 Year.	1 to 4 inclusive.	5 to 9 inclusive.	10 to 14 inclusive.	15 to 19 inclusive.	65 Years and over.	Pneumonia.	Diarrheal Diseases under 5.	Cerebro-spinal Meningitis.	Influenza.	Puerteral Septicemia.	Cancer.	Violence.	Smallpox.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Shelby.....	26,906	370	13.7	15	73	24	10	4	13	119	38	8	14	2	1	3	27	18	16	2	15	4	15	4	15	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Ohio.....	4,724	127	2	3	10	...	1	3	21	11	1	...	2	2	6	...	1	1	6	2	...	1	3	4	1	4	1
Orange.....	17,724	218	15	46	22	...	5	10	53	43	1	...	1	1	27	...	1	1	27	8	...	1	3	4	1	4	1
Perry.....	18,093	207	17	54	17	...	8	13	69	42	...	...	2	2	34	...	2	2	34	15	...	5	4	1	10	1	...
Pike.....	21,283	328	26	80	32	...	13	17	71	42	...	...	5	5	43	...	...	...	43	21	...	3	4	1	17	1	...
Posey.....	22,653	319	16	87	32	...	6	10	66	41	...	...	0	0	31	...	...	...	31	21	...	1	4	1	19	...	...
Ripley.....	20,093	290	9	41	9	...	8	5	92	28	...	...	1	1	38	...	...	...	38	5	...	2	5	6	17	...	...
Scott.....	8,097	127	4	22	10	...	2	2	39	24	...	...	1	1	15	...	...	...	15	10	...	1	6	4	4	...	...
Spencer.....	24,246	277	9	53	16	...	9	9	80	48	...	...	2	2	20	...	2	2	20	14	...	1	11	9	11	...	...
Sullivan.....	26,436	465	34	131	59	...	10	13	99	46	...	...	7	7	44	...	4	4	44	28	...	5	6	12	29	...	...
Switzerland.....	11,840	142	4	26	6	...	4	5	48	22	...	...	1	1	10	...	...	...	10	56	...	4	5	12	13	...	...
Vanderburgh.....	74,553	1,161	71	265	83	...	29	20	201	143	...	...	32	32	80	...	2	2	80	20	...	4	19	44	65	...	...
Warick.....	22,796	304	21	82	13	...	10	9	68	32	...	...	3	3	38	...	1	1	38	23	...	6	6	5	11	...	...
Washington.....	19,723	270	12	58	13	...	7	5	78	39	...	...	9	9	42	...	3	3	42	13	...	1	7	6	7	...	...

TABLE No. 4.—Continued.

STATE AND COUNTIES.	Population, Estimated According to U. S. Census Bureau.	Total Deaths Reported for the Year 1905.	Annual Death Rate per 1,000 Population.	Stillbirths.	IMPORTANT AGES.						DEATHS FROM IMPORTANT CAUSES.											
					Under 1 Year.	1 to 4 inclusive.	5 to 9 inclusive.	10 to 14 inclusive.	15 to 19 inclusive.	20 Years and over.												
Shelby.....	26,906	370	13.7	15	73	24	10	4	13	119	38	8	14	2	1	3	1	27	18	16	18	Violence.
Tippecanoe.....	40,091	632	15.7	17	86	27	10	8	14	224	67	4	15	6	5	3	4	49	46	28	46	Violence.
Tipton.....	19,500	284	12.0	18	56	22	2	2	9	59	25	2	6	3	1	1	2	13	10	13	10	Violence.
Union.....	6,748	85	12.5	1	7	3			1	50	8	...	...	...	...	...	...	6	7	7	7	Violence.
Vermillion.....	16,091	268	16.0	17	79	19	3	6	10	51	27	5	6	1	1	3	1	22	15	10	17	Violence.
Vigo.....	66,771	1,118	16.7	97	284	91	25	26	41	208	96	8	26	22	2	2	1	140	46	31	90	Violence.
Warren.....	11,537	133	11.5	4	21	10	1	1	7	44	9	...	...	...	...	...	...	14	10	6	6	Violence.
Wayne.....	39,507	578	14.6	15	77	26	2	7	13	223	58	10	4	1	1	1	1	48	15	25	36	Violence.
Southern Counties..	675,097	9,720	14.4	564	2,275	810	237	194	383	2,362	1,260	143	300	125	17	53	42	1,017	483	319	516	Violence.
Clark.....	32,465	468	14.4	36	105	42	9	8	11	122	52	12	9	3	2	2	5	41	22	18	32	Violence.
Crawford.....	13,476	169	12.5	5	45	15	6	...	8	38	28	6	15	4	1	6	3	11	13	13	9	Violence.
Davies.....	31,989	437	13.9	24	118	42	12	8	13	107	50	6	10	2	1	2	3	46	22	15	21	Violence.
Dearborn.....	22,194	339	15.2	19	64	17	6	7	11	117	46	6	10	1	1	2	4	40	22	12	25	Violence.
Dubois.....	20,399	280	13.7	20	68	26	6	7	7	65	30	1	11	1	1	4	4	41	22	7	18	Violence.
Floyd.....	30,392	479	15.7	24	87	28	10	14	19	122	62	7	17	3	2	6	1	27	10	18	29	Violence.
Gibson.....	32,171	486	13.5	30	121	33	14	11	14	89	50	4	17	11	1	5	7	59	22	9	29	Violence.
Greene.....	30,190	496	16.4	24	129	59	18	8	23	109	65	6	14	6	1	1	1	66	30	11	37	Violence.
Harrison.....	22,668	281	12.7	12	59	12	5	9	16	83	38	12	15	2	1	3	1	28	3	9	12	Violence.
Jackson.....	27,631	412	14.9	30	122	37	10	5	26	82	59	12	15	1	1	4	4	47	24	10	27	Violence.
Jefferson.....	22,913	347	15.1	14	52	29	8	3	14	121	57	4	4	13	...	2	...	39	9	11	11	Violence.
Jennings.....	16,217	226	13.9	13	51	13	7	6	6	81	37	2	8	2	...	5	...	74	30	13	25	Violence.
Knox.....	31,627	545	15.8	42	167	62	13	4	16	103	50	6	19	7	1	4	5	70	30	19	25	Violence.
Lawrence.....	28,104	424	15.0	20	106	49	14	7	14	93	56	6	27	7	1	2	...	48	36	16	20	Violence.
Martin.....	16,006	178	11.3	13	39	18	5	4	6	39	32	6	9	...	2	...	...	18	5	7	8	Violence.

Miami.....	29,352	85.1	3.4	37.4	3.4	.....	3.4	.....	6.3	122.6	81.7	37.4	30.6	3.4	40.8	54.5	.....
Newton.....	11,106	81.0	9.0	27.0	.....	4.2	.....	4.2	4.2	99.0	90.0	9.0	9.0	.....	42.3	54.0	.....
Noble.....	23,603	88.9	21.1	21.1	10.1	.....	5.0	.....	10.1	98.2	23.4	12.7	4.2	.....	81.5	72.0	.....
Porter.....	19,624	91.7	30.5	20.3	.....	.....	.....	.....	.....	193.6	56.0	5.0	20.3	.....	.....	101.9	.....
Pulaski.....	15,153	92.3	.....	39.5	13.1	.....	.....	.....	.....	131.8	46.1	13.1	13.1	.....	65.9	26.3	.....
Stark.....	11,668	137.1	.....	51.4	25.7	.....	.....	.....	.....	154.2	60.0	17.1	42.8	.....	17.1	94.2	.....
Stearns.....	15,515	109.5	25.7	19.3	25.7	.....	.....	.....	.....	45.1	19.3	45.1	45.1	.....	38.6	83.7	.....
St. Joseph.....	65,451	165.0	21.3	29.0	10.6	.....	9.1	.....	7.6	123.7	142.0	15.2	10.6	.....	64.1	97.7	9.1
Wabash.....	23,679	135.9	6.9	17.4	20.9	3.4	3.4	.....	.....	69.7	34.8	24.4	6.9	3.4	48.8	83.6	.....
Wells.....	24,223	127.9	12.3	28.8	8.2	.....	.....	.....	.....	132.1	86.6	4.1	12.3	12.3	49.5	94.9	.....
White.....	20,525	73.0	9.7	58.4	9.7	.....	9.7	.....	4.8	87.6	19.4	31.1	31.1	9.7	58.4	73.0	.....
Whitley.....	17,328	75.0	11.5	51.9	5.7	.....	.....	.....	.....	80.7	40.3	.....	.....	5.7	46.1	51.9	.....
Central Counties.....	1,087,620	159.5	20.5	31.9	10.0	7	4.1	2	5.4	138.6	58.1	15.0	21.7	5.8	52.1	76.0	.6
Bartholomew.....	24,885	212.9	12.0	36.1	4.0	4.0	.....	.....	4.0	144.6	84.3	24.1	32.1	8.0	88.4	36.1	.....
Boone.....	26,321	178.5	18.9	26.5	11.3	3.7	3.7	.....	11.3	98.7	45.5	18.9	30.3	.....	56.9	53.1	.....
Brown.....	9,727	143.9	30.8	.....	.....	10.2	.....	.....	.....	82.2	41.1	.....	41.1	.....	30.8	41.1	.....
Clay.....	35,785	125.7	5.5	27.9	5.5	2.7	11.1	.....	11.1	75.4	81.0	13.9	11.1	25.1	19.5	81.0	2.7
Clinton.....	23,535	241.8	14.0	38.6	3.5	.....	.....	.....	14.0	168.2	42.0	14.9	35.0	7.0	59.5	84.8	.....
Decatur.....	19,614	173.3	20.3	25.4	.....	.....	15.2	.....	10.0	137.6	50.9	.....	61.1	5.0	81.5	112.1	.....
Delaware.....	57,421	144.5	26.1	48.7	22.6	.....	.....	.....	1.7	120.1	52.2	13.9	19.1	5.2	36.5	87.0	1.7
Fayette.....	13,841	202.2	21.6	14.4	.....	.....	7.2	.....	.....	158.9	36.1	38.1	57.7	.....	43.3	43.3	.....
Fountain.....	22,201	108.1	13.5	31.5	4.5	.....	18.0	.....	.....	90.0	49.5	13.5	45.0	4.5	31.5	72.0	.....
Franklin.....	16,388	170.8	18.3	12.2	.....	.....	6.1	.....	.....	128.1	54.9	12.2	30.5	.....	42.7	30.5	.....
Hamilton.....	31,430	149.5	19.0	47.7	6.3	.....	3.1	.....	3.1	120.9	63.6	6.3	31.8	3.1	41.3	22.2	.....
Hancock.....	19,755	161.9	25.3	25.3	15.1	.....	.....	.....	.....	192.3	101.2	25.3	20.2	.....	50.6	70.8	.....
Hendricks.....	21,292	169.0	4.6	14.0	4.6	.....	.....	.....	.....	131.5	32.8	9.3	23.4	4.6	42.2	51.6	.....
Henry.....	25,572	144.6	19.5	46.9	7.8	.....	.....	3.9	.....	74.3	46.9	39.1	19.5	7.8	62.5	66.4	.....
Johnson.....	20,488	180.5	34.1	14.6	4.8	.....	.....	.....	.....	146.4	53.6	14.6	4.8	4.8	43.9	53.6	.....
Madison.....	31,063	95.1	15.4	40.4	8.3	1.1	.....	.....	1.1	67.8	73.7	16.6	11.8	71.3	38.0	57.1	.....
Marion.....	21,655	193.4	27.7	29.5	10.9	.....	4.0	.....	4.5	17.0	46.8	14.5	16.3	4.5	53.7	99.2	.4
Monroe.....	22,153	148.9	16.0	58.6	22.5	.....	27.0	.....	4.5	108.8	103.8	13.5	13.5	13.5	40.6	49.6	.....
Montgomery.....	29,933	160.3	16.7	16.7	3.3	.....	.....	.....	13.3	126.9	66.8	16.7	23.3	10.0	83.5	40.0	.....
Morgan.....	21,183	169.9	18.8	4.7	.....	.....	.....	.....	18.8	212.4	56.6	4.7	37.7	9.4	61.3	51.9	.....
Owen.....	15,193	184.2	26.3	26.3	.....	.....	13.1	.....	6.5	171.1	46.0	13.1	6.5	6.5	52.6	74.7	.....
Parke.....	24,082	149.4	37.3	33.2	16.6	4.1	12.4	.....	4.1	178.5	62.2	4.1	16.6	4.1	45.6	72.6	.....
Putnam.....	21,478	190.8	18.6	37.2	4.6	.....	.....	.....	.....	214.1	23.2	9.3	13.8	4.6	55.8	51.2	.....
Randolph.....	28,860	155.8	20.7	20.7	13.8	.....	.....	.....	.....	114.2	90.0	20.7	24.2	.....	45.0	41.5	.....
Rush.....	20,594	101.9	29.1	14.5	4.8	.....	.....	.....	9.7	97.1	63.1	14.5	.....	4.8	58.2	43.7	.....

Miami.....	29,352	85.1	3.4	37.4	3.4	.....	6.8	122.6	81.7	37.4	30.6	3.4	40.8	54.5	.....
Newton.....	11,106	81.0	9.0	27.0	.....	.....	4.2	99.0	90.0	9.0	9.0	.....	42.3	54.0	.....
Noble.....	23,603	88.9	21.1	21.1	.....	.....	.....	98.2	23.4	12.7	4.2	.....	81.5	72.0	.....
Porter.....	19,624	91.7	30.5	20.3	10.1	5.0	10.1	193.6	56.0	5.0	20.3	5.0	.....	101.9	.....
Pulaski.....	15,153	92.3	.....	39.5	13.1	.....	.....	131.8	46.1	13.1	13.1	.....	65.9	26.3	.....
Starke.....	11,668	137.1	.....	51.4	25.7	.....	.....	154.2	60.0	17.1	42.8	.....	17.1	94.2	.....
Stark.....	15,515	109.5	25.7	19.3	25.7	.....	.....	45.1	19.3	19.3	45.1	.....	96.6	83.7	.....
Steuben.....	65,451	165.0	21.3	29.0	10.6	9.1	.....	123.7	143.0	15.2	10.6	.....	64.1	97.7	9.1
St. Joseph.....	23,679	135.9	6.9	17.4	20.9	3.4	.....	69.7	34.8	24.4	6.9	.....	48.8	83.6	.....
Wabash.....	24,223	127.9	12.3	28.8	8.2	.....	.....	132.1	86.6	4.1	12.3	.....	49.5	94.9	.....
Wells.....	20,525	73.0	9.7	58.4	9.7	9.7	.....	87.6	19.4	.....	31.1	.....	9.7	58.4	.....
White.....	17,328	75.0	11.5	51.9	5.7	.....	.....	80.7	40.3	17.3	.....	.....	5.7	46.1	.....
Whitley.....	1,087,620	159.5	20.5	31.9	10.0	7	2	138.6	58.1	15.0	21.7	5.8	52.1	76.0	.....
Central Counties.....	24,885	212.9	12.0	36.1	4.0	4.0	.....	144.6	84.3	24.1	32.1	8.0	88.4	36.1	.....
Bartholomew.....	26,321	178.5	18.9	26.5	11.3	3.7	.....	98.7	45.5	18.9	30.3	.....	56.9	53.1	.....
Boone.....	9,727	143.9	30.8	.....	.....	10.2	.....	82.2	41.1	.....	41.1	.....	30.8	41.1	.....
Brown.....	35,785	125.7	5.5	27.9	5.5	2.7	.....	11.1	75.4	81.0	11.1	25.1	19.5	81.0	2.7
Clay.....	28,535	241.8	14.0	38.6	3.5	.....	.....	14.0	168.2	42.0	35.0	7.0	59.5	84.8	.....
Clinton.....	19,614	173.3	20.3	25.4	.....	.....	.....	10.0	37.6	50.9	61.1	5.0	81.5	112.1	.....
Decatur.....	57,421	144.5	26.1	48.7	22.6	.....	.....	1.7	120.1	52.2	13.9	5.2	36.5	87.0	1.7
Delaware.....	13,841	202.2	21.6	14.4	.....	.....	.....	158.9	36.1	36.1	57.7	.....	43.3	43.3	.....
Fayette.....	22,201	108.1	13.5	31.5	4.5	.....	.....	90.0	49.5	13.5	45.0	4.5	31.5	72.0	.....
Fountain.....	16,388	170.8	18.3	12.2	.....	.....	.....	128.1	54.9	12.2	30.5	.....	42.7	30.5	.....
Franklin.....	31,430	149.5	19.0	47.7	6.3	.....	.....	3.1	63.6	6.3	31.6	3.1	41.3	22.2	.....
Hamilton.....	19,755	161.9	25.3	25.3	15.1	.....	.....	192.3	101.2	25.3	20.2	.....	50.6	70.8	.....
Hancock.....	21,292	169.0	4.6	14.0	4.6	.....	.....	31.5	32.8	9.3	23.4	4.6	42.2	51.6	.....
Hendricks.....	25,572	144.6	19.5	46.9	7.8	.....	3.9	74.3	46.9	39.1	19.5	7.8	62.5	66.4	.....
Henry.....	20,468	180.5	34.1	14.6	4.8	.....	.....	146.4	53.6	14.6	4.8	4.8	43.9	53.6	.....
Johnson.....	81,063	95.1	15.4	40.4	8.3	1.1	.....	1.1	67.8	16.6	11.8	71.3	38.0	57.1	.....
Madison.....	219,656	183.4	27.7	29.5	10.9	.....	.....	4.5	17.0	14.5	16.3	4.5	53.7	99.2	.....
Marion.....	22,153	148.9	27.0	58.6	22.5	4.0	4	4.5	108.8	13.5	16.3	4.5	40.6	49.0	4
Monroe.....	29,933	160.3	16.7	16.7	3.3	27.0	.....	13.3	126.9	13.5	13.5	13.5	83.5	40.6	.....
Montgomery.....	21,183	169.9	18.8	4.7	.....	.....	.....	18.8	212.4	56.6	37.7	9.4	61.3	51.9	.....
Morgan.....	15,193	184.2	26.3	26.3	.....	.....	.....	6.5	171.1	46.0	6.5	6.5	52.6	52.6	.....
Owen.....	24,062	149.4	37.3	3.2	16.6	4.1	.....	4.1	178.5	62.2	4.1	16.6	4.1	74.7	.....
Parke.....	21,478	190.8	18.6	37.2	4.6	12.4	.....	.....	23.2	9.3	9.3	4.6	55.8	51.2	.....
Putnam.....	28,860	155.4	20.7	20.7	13.8	.....	.....	.....	114.2	90.0	2.7	13.8	45.0	41.5	.....
Randolph.....	20,594	101.9	29.1	14.5	4.8	.....	9.7	97.1	63.1	14.5	24.2	4.8	58.2	43.7	.....
Rush.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 5—Continued.

STATE AND COUNTIES.	Population, Estimated According to Method of U. S. Census Bureau.	DEATHS FROM IMPORTANT CAUSES.															
		Pulmonary Consumption.	Other Forms of Tuberculosis.	Typhoid Fever.	Diphtheria.	Group.	Scarlet Fever.	Measles.	Whooping Cough.	Pneumonia.	Diarrheal Diseases Under 5.	Cerebro-Spinal Meningitis.	Influenza.	Puerperal Septicemia.	Cancer.	Violence.	Smallpox.
Shelby	26,906	141.2	28.9	52.1	7.4	3.7	11.1	.....	.....	100.8	68.9	14.8	55.7	7.4	59.4	69.9	.....
Tippecanoe	40,991	167.1	38.4	37.4	12.4	.....	4.9	.....	7.4	122.2	28.9	14.8	37.4	7.4	69.8	114.6	.....
Tipton	19,500	138.2	10.2	30.7	.....	.....	.....	.....	.....	68.6	62.0	10.2	30.7	.....	68.6	51.2	.....
Union	6,748	118.5	.....	44.4	.....	.....	.....	.....	44.4	88.9	14.8	14.8	14.8	.....	108.7	103.7	.....
Vermillion	16,091	167.8	31.0	37.2	6.2	.....	18.6	6.2	6.2	136.7	93.2	12.4	18.6	6.2	62.1	105.6	.....
Vigo	64,771	143.7	11.9	38.5	32.9	.....	2.9	.....	13.4	209.6	68.2	22.4	10.4	7.4	46.4	131.7	.....
Warren	11,537	173.0	60.6	8.6	.....	.....	.....	.....	17.4	121.3	96.0	8.6	26.0	8.6	52.0	62.0	.....
Wayne	39,507	146.8	25.3	10.1	2.5	2.5	.....	.....	2.5	121.4	37.9	12.6	25.3	2.5	63.2	91.1	.....
.....	673,097	187.1	21.2	44.5	18.5	2.5	7.8	.....	6.2	151.0	71.7	20.9	28.3	8.9	47.3	76.6	2.8
Clark	32,465	160.1	36.9	27.7	9.2	6.1	6.1	.....	15.4	126.2	67.7	9.2	27.7	.....	55.4	98.5	3.0
Crawford	13,476	192.9	7.4	37.1	14.8	14.8	.....	.....	.....	81.6	46.4	14.8	14.8	.....	37.1	68.7	14.3
Daviess	31,369	159.2	19.1	47.7	12.7	3.1	19.1	.....	9.5	146.5	70.6	28.6	31.8	19.1	41.4	66.9	.....
Dearborn	22,191	202.7	27.0	45.0	.....	.....	9.0	.....	.....	180.2	31.5	18.0	18.0	9.0	51.0	112.6	.....
Dubois	20,399	117.0	4.9	53.9	4.9	.....	.....	.....	19.6	200.9	107.8	19.6	21.5	14.7	34.3	88.2	8.9
Gibson	30,382	201.0	23.0	55.9	9.8	6.5	19.7	.....	3.2	88.8	32.9	23.0	29.6	9.8	59.2	35.4	.....
Greene	32,171	155.4	12.4	43.5	34.1	3.1	.....	.....	.....	183.3	64.3	15.5	21.7	6.2	27.9	90.1	.....
Harrison	30,190	182.1	19.8	56.3	19.8	3.3	16.5	.....	23.1	185.4	94.3	16.5	26.4	16.5	36.4	122.5	6.6
Jackson	22,083	172.1	9.0	51.3	9.0	4.5	13.5	.....	4.5	126.8	13.5	18.1	51.3	4.5	40.7	51.3	.....
Jefferson	27,631	213.5	43.4	51.2	3.6	.....	14.4	.....	.....	170.0	86.8	25.3	31.5	3.6	36.1	97.7	.....
Jefferson	22,913	218.7	17.4	17.4	56.7	.....	8.7	.....	.....	170.2	39.2	.....	39.2	8.7	48.0	48.0	.....
Jennings	16,217	228.1	12.3	49.3	12.3	.....	21.6	.....	.....	123.3	49.3	18.4	30.8	6.1	80.1	30.8	.....
Knox	31,627	144.3	11.5	54.8	8.6	2.8	14.4	.....	14.4	213.7	86.6	28.8	5.7	5.7	51.8	72.1	3.6
Lawrence	28,101	199.2	32.0	96.0	24.9	3.5	.....	.....	.....	149.4	128.0	14.2	39.1	14.2	53.3	71.1	.....
Martin	15,006	213.2	39.9	59.9	.....	13.3	13.3	.....	.....	119.9	33.3	33.3	26.6	13.3	46.6	53.3	.....

Ohio.....	4,724	232.8	21.1	62.0	11.2	5.6	5.6	127.0	42.3	11.2	21.1	5.6	81.6	21.1	.....
Orange.....	17,724	242.6	22.5	36.8	10.5	.....	.....	152.3	45.1	5.2	16.9	26.3	45.1	22.5	.....
Perry.....	18,993	221.1	36.8	36.8	10.5	.....	.....	17.3	78.9	5.2	21.0	26.3	36.8	62.6	.....
Pike.....	21,293	197.5	14.1	32.9	23.5	.....	.....	202.2	98.7	82.9	23.5	9.4	56.4	79.9	4.7
Posey.....	22,655	180.9	35.3	22.0	26.4	.....	.....	150.0	92.6	35.3	30.8	4.4	57.3	83.4	.....
Ripley.....	20,093	139.3	29.8	14.9	4.9	14.9	.....	179.1	24.8	.....	24.8	9.9	29.8	81.6	.....
Scott.....	8,497	262.4	11.7	70.6	11.7	11.7	.....	176.5	117.6	11.7	70.6	.....	47.0	47.0	.....
Spencer.....	22,516	212.8	13.3	26.6	8.8	.....	.....	88.7	62.0	35.4	48.7	4.4	39.9	46.7	.....
Sullivan.....	26,456	170.0	18.8	45.3	26.4	7.1	.....	166.3	105.8	34.0	22.6	18.8	45.3	109.6	34.0
Switzerland.....	11,840	185.8	25.3	16.8	8.4	8.4	.....	84.4	16.8	33.7	42.2	.....	101.3	109.7	.....
Vanderburgh.....	76,553	186.7	20.9	36.5	41.8	1.3	.....	101.5	73.1	26.1	21.8	5.2	57.4	81.9	1.3
Warrick.....	22,796	140.3	8.7	52.6	13.1	4.3	.....	146.6	109.6	13.1	26.3	.....	21.9	46.2	.....
Washington.....	19,725	197.7	10.1	45.6	25.3	.....	.....	212.9	66.9	30.4	35.4	5.0	30.4	35.4	.....

TABLE 6.

Annual Death Rates for Six Years, 1900 to 1906, With Averages of Cities of 10,000 Population and Over, Compared With Rural and State Rates.

	Popu- lation.	1900.	1901.	1902.	1903.	1904.	1905.	Average.
STATE	2,658,549	14.2	13.8	12.8	12.2	13.5	13.7	13.3
CITIES—								
Indianapolis	204,622	20.3	16.9	16.2	18.1	17.4	16.0	17.3
Evanville	62,307	15.2	14.5	11.2	14.7	14.9	14.4	14.1
Fort Wayne	49,003	13.1	14.8	14.1	14.8	14.0	13.9	14.1
Muncie	25,309	19.9	16.0	16.7	18.1	17.8	16.0	17.4
South Bend	41,728	16.1	15.0	14.6	19.2	15.9	17.1	16.3
Terre Haute	39,257	16.1	19.1	20.6	18.3	23.1	21.0	19.7
Anderson	23,964	16.5	17.5	16.7	14.6	15.5	12.1	15.5
Elkhart	16,712	16.1	13.2	12.5	14.3	15.4	13.6	14.2
Elwood	17,138	17.4	15.1	14.0	14.7	13.4	11.6	14.4
Hammond	14,896	10.5	14.8	18.1	19.1	15.4	15.2	15.5
Huntington	10,325	12.9	13.4	13.2	16.5	17.1	12.7	14.3
Jeffersonville	10,818	17.5	22.3	19.5	21.7	20.3	17.7	19.8
Kokomo	11,549	16.2	16.0	16.1	20.8	18.5	18.7	17.7
Lafayette	18,864	14.5	16.8	17.9	18.4	21.5	21.6	18.4
Logansport	17,356	15.4	17.5	15.1	15.9	17.6	17.1	16.4
Marion	22,082	16.9	15.8	15.5	17.5	16.6	14.0	16.0
Michigan City	16,478	10.7	14.7	14.5	18.8	14.7	14.1	14.6
New Albany	20,628	17.4	18.0	17.4	16.6	18.1	18.1	17.6
Richmond	18,874	17.4	16.6	18.3	14.0	15.8	14.0	16.0
Vincennes	11,012	15.5	19.2	17.8	15.1	22.2	20.7	18.4
Average		15.8	15.8	16.0	17.1	17.2	16.0	16.3
COUNTRY	1,666,283	13.7	13.3	12.1	11.3	12.8	11.9	12.5

TABLE A.—Continued.

COUNTIES.	1905.												Sex.		Color.		Nationality.		Not Re-ported.		
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Fathers.	Mothers.	Fathers.	Mothers.
Gibson	74	72	82	83	48	22	61	50	43	56	60	45	371	286	657	357	270	639	646	5	2
Grant	54	54	45	43	70	102	92	58	65	27	39	23	371	359	730	347	346	724	724	36	33
Greene	40	41	62	33	27	35	42	58	52	26	21	32	259	231	490	259	228	95	95	15	4
Hamilton	60	37	36	43	25	35	59	44	25	42	38	24	254	211	465	246	225	457	475	15	4
Hancock	13	27	41	32	50	35	29	29	38	32	36	27	203	166	369	202	181	384	384	2	2
Harrison	30	31	23	30	24	17	34	30	17	28	24	21	173	139	312	173	139	308	308		
Hendricks	35	19	25	38	31	25	39	34	32	46	31	19	194	205	399	192	203	390	392	1	1
Henry	44	40	75	33	11	43	58	48	41	52	42	26	229	264	493	226	260	483	485	5	3
Howard	45	47	47	50	46	45	42	40	23	51	36	36	281	239	520	280	234	500	506	14	12
Huntington	63	51	60	55	50	37	43	56	63	47	52	58	326	309	635	326	309	618	625	10	4
Jackson	40	47	33	70	43	47	49	55	30	38	45	54	301	250	551	298	250	529	540	10	4
Jasper	36	9	9	6	14	10	2	5	10	22	31	19	91	82	173	91	82	154	160	19	13
Jay	55	53	37	56	60	63	51	54	45	46	50	51	271	294	565	323	252	590	603	7	6
Jefferson	15	20	21	18	20	21	23	20	12	18	15	11	113	112	225	109	105	212	218	6	3
Jennings	22	19	31	18	20	11	32	27	23	26	22	26	139	149	288	136	144	278	279	6	6
Johnson	23	23	13	30	23	20	27	27	21	14	16	24	142	119	261	140	119	259	259	1	1
Knox	92	92	83	76	81	75	75	95	87	111	95	69	515	516	1,031	508	508	990	1,000	28	22
Kosciusko	46	46	48	50	34	35	59	39	27	35	32	21	217	205	422	216	205	404	407	3	4
Lacrosse	24	28	41	31	32	26	25	39	32	26	31	24	191	178	369	191	178	353	357	10	6
Lake	61	72	68	76	50	45	66	60	41	60	52	69	380	330	720	389	330	382	429	31	290
Laporte	56	57	61	63	61	61	60	58	61	60	62	68	389	365	754	388	385	540	568	198	176
Lawrence	33	40	63	54	60	58	41	39	58	46	45	32	306	273	579	306	273	575	575		
Madison	134	96	98	117	140	104	119	109	162	142	109	108	735	701	1,436	728	694	1,361	1,375	60	50
Marion	362	345	426	345	319	305	407	419	385	355	311	392	2,297	2,190	4,487	2,073	1,966	3,842	4,027	464	361
Marshall	41	42	41	42	40	46	46	42	41	37	36	32	243	252	495	243	252	478	483	13	8
Martin	15	24	25	6	10	9	4	6	14	17	14	11	161	161	322	161	161	144	161		
Miami	25	33	22	43	24	24	28	24	29	24	24	11	130	150	280	130	150	258	290	7	7
Monroe	25	35	37	30	49	31	30	35	40	38	26	15	213	178	391	210	175	378	388		

Montgomery.....	52	47	47	52	53	50	46	48	39	28	280	306	566	258	305	2	1	560	562	3	3	3	1
Morgan.....	21	32	26	23	12	21	21	26	23	40	142	138	280	132	107	1	1	275	275	16	9	15	20
Morgan.....	19	12	14	14	12	22	22	21	22	22	128	107	230	124	107	2	2	190	201	13	8	8	5
Morgan.....	22	36	33	19	12	22	22	31	46	27	136	153	318	168	153	1	2	326	334	73	73	73	73
Morgan.....	2	4	5	4	9	3	8	8	9	7	39	34	73	38	32	2	1	73	73	1	1	1	1
Morgan.....	30	10	20	11	28	27	22	18	24	14	121	245	216	121	123	1	1	59	59	182	182	182	182
Morgan.....	14	19	9	9	24	24	22	18	24	15	130	166	216	131	123	1	1	214	214	1	1	1	1
Morgan.....	16	10	20	23	10	24	22	15	24	15	135	100	216	131	123	1	1	221	221	5	5	5	5
Morgan.....	39	32	38	23	36	20	24	44	22	163	174	337	163	174	174	3	3	329	332	2	2	2	2
Morgan.....	38	41	43	36	40	26	26	27	20	32	209	178	387	206	176	3	2	375	378	1	1	1	1
Morgan.....	15	19	18	21	14	14	27	17	16	11	109	220	220	111	109	3	3	177	207	39	9	9	9
Morgan.....	41	32	38	36	20	50	41	31	33	23	113	238	441	211	223	3	3	177	207	39	9	9	9
Morgan.....	41	32	38	36	20	50	41	31	33	23	113	238	441	211	223	3	3	177	207	39	9	9	9
Morgan.....	35	36	43	40	46	47	45	32	30	44	57	264	121	211	223	3	3	177	207	39	9	9	9
Morgan.....	51	42	52	65	54	62	54	41	41	41	308	258	536	306	284	2	2	581	587	4	4	4	4
Morgan.....	16	11	12	13	9	26	23	23	11	12	92	81	173	91	80	1	1	160	166	8	4	4	4
Morgan.....	20	17	14	25	23	17	15	16	10	14	112	92	204	112	92	1	1	160	166	8	4	4	4
Morgan.....	8	9	10	23	15	6	15	12	5	9	75	62	137	152	127	7	7	287	288	3	3	3	3
Morgan.....	112	61	19	169	93	71	150	116	141	10	88	69	157	152	127	7	7	287	288	3	3	3	3
Morgan.....	22	24	27	26	29	23	23	23	23	23	206	185	391	205	185	1	1	380	386	4	4	4	4
Morgan.....	16	9	11	10	20	13	14	16	15	11	131	124	255	129	122	2	2	238	241	4	4	4	4
Morgan.....	16	9	11	10	20	13	14	16	15	11	131	124	255	129	122	2	2	238	241	4	4	4	4
Morgan.....	34	41	26	31	47	20	60	54	35	23	250	205	455	249	205	1	1	391	412	57	36	36	36
Morgan.....	24	35	48	21	49	16	35	39	19	41	197	185	382	197	185	1	1	388	370	3	3	3	3
Morgan.....	3	3	6	11	17	6	10	11	3	9	52	43	95	52	43	3	3	95	95	4	4	4	4
Morgan.....	116	96	111	112	71	94	102	115	100	96	576	633	1,240	529	575	47	58	1,101	1,129	65	41	33	29
Morgan.....	42	38	28	32	38	29	19	38	28	24	196	180	376	195	180	1	1	323	328	28	28	28	28
Morgan.....	138	100	82	35	91	73	124	89	69	43	577	520	1,097	543	485	34	35	1,001	1,020	79	68	10	2
Morgan.....	45	27	35	74	32	38	29	45	42	33	247	242	489	245	241	2	1	465	478	8	1	3	3
Morgan.....	15	9	11	13	11	22	22	25	16	14	85	86	171	84	86	1	1	167	166	1	3	2	1
Morgan.....	29	30	12	19	41	20	26	37	31	32	145	153	298	145	153	1	1	294	294	1	1	1	1
Morgan.....	17	15	21	34	41	4	27	18	10	10	126	108	234	126	108	1	1	232	232	1	1	1	1
Morgan.....	76	52	50	63	62	65	92	70	51	49	400	335	735	390	320	20	15	690	718	39	18	3	1
Morgan.....	38	35	27	41	39	31	32	29	33	18	199	185	384	199	185	1	1	364	371	7	6	7	7
Morgan.....	43	29	20	74	34	25	37	30	13	64	205	219	424	205	219	1	1	34	34	1	1	1	1
Morgan.....	22	25	19	6	8	15	11	11	21	27	95	87	182	95	87	1	1	179	179	1	1	1	1
Morgan.....	22	25	19	6	8	15	11	11	21	27	95	87	182	95	87	1	1	179	179	1	1	1	1
Morgan.....	3,858	3,585	3,627	3,903	3,754	3,223	4,217	3,898	3,713	3,731	22,781	21,333	44,114	22,290	20,869	491	464	39,527	40,361	2,582	2,060	1,572	1,260
Total.....	3,858	3,585	3,627	3,903	3,754	3,223	4,217	3,898	3,713	3,731	22,781	21,333	44,114	22,290	20,869	491	464	39,527	40,361	2,582	2,060	1,572	1,260

TABLE B.

Births, Number of Children Born to Each Mother, Grouped Ages of Parents, Still, Plurality and Illegitimate Births, Year Ending December 31, 1905.

COUNTIES.	NUMBER OF CHILDREN BORN TO EACH MOTHER.													
	Total Births.	First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Ninth.	Tenth.	Eleventh.	Twelfth and Over.	Not Reported.
Adams.....	397	141	76	54	42	21	26	8	12	7	3	3	4	1
Allen.....	1,250	332	274	184	124	94	69	43	43	32	14	9	10	22
Bartholomew.....	497	147	122	72	40	36	30	13	6	11	4	2	1	3
Benton.....	241	68	53	36	32	13	11	8	6	4	3	3	4	1
Blackford.....	471	150	99	61	59	35	20	22	13	6	2	.....	3	1
Boone.....	528	145	120	74	68	39	21	19	15	7	9	.....	5	4
Brown.....	123	19	26	22	9	15	6	12	2	6	2	.....	3	.....
Carroll.....	362	112	74	53	33	28	24	18	5	1	4	.....	1	.....
Cass.....	385	109	100	51	42	31	19	9	8	6	4	.....	4	8
Clark.....	382	106	83	45	46	29	26	20	13	2	5	.....	5	.....
Clay.....	511	123	112	79	48	50	32	26	17	2	7	.....	9	.....
Clinton.....	500	123	116	85	67	30	29	20	17	8	2	.....	7	.....
Crawford.....	228	56	49	46	29	14	14	8	8	4	4	.....	9	.....
Davies.....	189	717	182	99	79	63	57	27	31	17	7	.....	4	10
Dearborn.....	375	104	83	61	34	24	21	12	9	12	6	.....	3	3
Decatur.....	347	111	79	44	39	25	11	12	9	2	5	.....	5	4
Dekalb.....	277	88	59	33	33	15	12	13	3	3	2	.....	1	1
Delaware.....	1,127	341	276	168	118	81	40	34	28	15	5	.....	5	12
Dubois.....	238	68	48	43	40	26	27	20	9	5	5	.....	2	.....
Elkhart.....	643	206	151	91	81	45	32	17	6	7	5	.....	1	.....

Eyette.....	259	99	52	35	27	19	10	9	1	1	3	1	2	2	5
Floyd.....	406	131	96	52	43	23	12	11	6	6	2	2	2	2	6
Kountain.....	346	132	76	49	45	24	13	4	8	2	1	1	1	1	1
Franklin.....	194	87	38	39	24	17	10	4	2	2	3	3	3	3	3
Fulton.....	260	87	49	42	31	13	12	10	8	2	3	3	3	3	3
Gibson.....	657	158	147	109	70	57	37	28	24	7	5	4	4	4	6
Grant.....	763	219	172	164	87	71	49	23	16	12	2	2	2	2	8
Greene.....	493	134	103	68	58	33	23	18	16	6	2	2	2	2	8
Hamilton.....	485	136	113	72	58	38	26	15	14	10	4	4	4	4	1
Hancock.....	389	110	99	75	53	28	21	15	4	5	1	1	1	1	1
Harrison.....	312	91	58	45	26	23	17	19	14	6	2	2	2	2	4
Hendricks.....	399	176	85	64	29	31	17	19	14	6	2	2	2	2	4
Henry.....	403	149	104	79	53	38	24	15	15	10	5	5	5	5	1
Howard.....	520	173	113	75	49	36	27	17	12	10	5	5	5	5	2
Huntington.....	635	189	150	108	57	43	37	23	12	8	2	2	2	2	3
Jackson.....	551	133	126	71	54	45	33	31	22	11	9	9	9	9	8
Jasper.....	173	47	42	19	25	15	8	8	16	4	2	2	2	2	1
Jay.....	627	120	130	110	63	62	29	22	14	10	5	5	5	5	1
Jefferson.....	225	68	55	39	18	10	9	8	13	8	3	3	3	3	4
Jennings.....	238	82	43	60	23	25	18	8	12	3	1	1	1	1	3
Johnson.....	251	65	59	42	34	24	17	9	4	17	2	2	2	2	1
Knox.....	1,031	269	205	149	130	86	70	52	24	14	14	14	14	14	1
Kosciusko.....	422	120	112	64	50	32	12	12	4	6	8	8	8	8	1
Lafayette.....	369	109	83	42	44	27	22	18	11	8	0	0	0	0	2
Lake.....	720	191	154	112	62	50	49	28	25	19	5	5	5	5	3
Laporte.....	754	215	171	114	93	65	30	11	18	12	9	9	9	9	5
Lawrence.....	579	169	131	80	64	38	32	21	15	13	6	6	6	6	6
Madison.....	1,433	420	337	205	141	103	90	61	27	20	10	10	10	10	7
Marion.....	4,477	1,638	1,015	612	406	265	176	110	77	50	46	46	46	46	38
Marshall.....	493	143	115	65	53	41	28	19	12	7	4	4	4	4	3
Martin.....	164	34	33	32	16	10	13	9	5	4	4	4	4	4	1
Miami.....	280	89	57	45	28	22	13	8	9	3	1	1	1	1	1
Monte.....	391	132	65	61	40	25	17	17	15	6	4	4	4	4	3
Montgomery.....	566	173	131	89	54	40	34	20	14	8	5	5	5	5	3
Morgan.....	280	64	68	49	31	24	15	9	13	3	1	1	1	1	3
Newton.....	235	69	50	38	26	12	9	5	11	4	2	2	2	2	7
Noble.....	349	90	78	54	52	34	15	12	6	3	1	1	1	1	2
Ohio.....	73	9	9	16	6	7	5	4	8	3	1	1	1	1	4
Orange.....	245	59	46	14	27	17	26	6	3	3	6	6	6	6	1
Owen.....	216	62	43	39	28	8	15	9	5	3	1	1	1	1	1

TABLE B.

Births, Number of Children Born to Each Mother, Grouped Ages of Parents, Still, Plurality and Illegitimate Births, Year Ending December 31, 1905.

COUNTIES.	Total Births.	NUMBER OF CHILDREN BORN TO EACH MOTHER.												
		First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Ninth.	Tenth.	Eleventh.	Twelfth and Over.	Not Reported.
Adams.....	397	141	76	54	42	21	26	8	12	7	3	2	4	1
Allen.....	1,250	332	274	184	124	94	69	43	43	32	14	3	10	22
Bartholomew.....	487	147	122	72	40	36	30	13	6	11	4	2	1	3
Benton.....	241	68	53	36	32	13	11	8	6	4	3	3	4	1
Blackford.....	471	150	99	61	59	35	20	22	13	6	2	.....	3	1
Boone.....	528	145	120	74	68	39	21	19	15	7	9	2	5	4
Brown.....	123	19	25	22	9	15	6	12	2	6	2	3	.....	.....
Carroll.....	352	112	74	53	33	28	24	18	5	1	4	4	1	8
Cass.....	385	109	100	51	42	31	19	9	8	6	4	2	4	.....
Clark.....	352	106	83	45	46	29	26	20	13	2	5	.....	5	.....
Clay.....	511	123	112	79	48	50	32	26	17	2	7	7	8	.....
Clinton.....	500	123	116	85	67	30	29	20	9	8	2	4	7	.....
Crawford.....	223	86	49	46	20	14	14	8	8	6	4	1	.....	.....
Davies.....	189	132	89	79	79	63	57	27	31	12	7	6	4	10
Dearborn.....	375	104	83	61	34	24	21	12	9	6	6	3	3	3
Decatur.....	347	111	79	44	39	25	11	12	9	2	5	5	1	4
Dekalb.....	277	88	59	48	33	15	12	13	3	3	2	.....	5	1
Delaware.....	1,127	341	276	168	118	81	64	34	28	15	5	4	2	12
Dubois.....	298	68	43	40	40	26	27	20	9	6	6	2	2	.....
Elkhart.....	643	206	151	91	81	45	32	17	6	7	8	1	1	.....

Eyette.....	259	99	52	85	27	19	10	9	1	1	3	1	2	.....	5
Floyd.....	131	131	89	92	48	23	12	11	6	6	8	2	2	.....	6
Fountain.....	146	162	76	49	45	24	13	13	2	2	1	1	2	.....	.....
Franklin.....	184	87	38	39	31	17	10	4	8	8	2	4	1	.....	.....
Fulton.....	260	87	49	42	31	13	10	10	.....	.....	.....	.....	.....	.....	.....
Gibson.....	687	158	147	109	70	57	87	28	24	7	5	4	5	.....	6
Grant.....	768	219	179	104	87	71	71	28	16	12	6	3	2	.....	8
Greene.....	480	134	106	58	58	58	26	18	8	6	9	3	2	.....	8
Hamilton.....	485	136	113	75	53	53	21	16	14	10	5	4	4	.....	1
Hancock.....	389	110	99	59	39	20	21	15	.....	.....	.....	.....	.....	.....	.....
Harrison.....	312	91	58	45	26	23	17	19	14	6	2	2	4	.....	4
Hendricks.....	399	176	85	64	36	31	30	15	10	6	2	.....	.....	.....	4
Henry.....	493	146	106	79	53	38	24	17	12	10	6	3	2	.....	1
Howard.....	520	173	113	75	48	36	27	17	13	9	.....	.....	.....	.....	2
Huntington.....	635	189	160	108	57	43	37	23	12	8	2	1	2	.....	3
Jackson.....	551	133	126	71	54	45	33	31	22	11	9	2	6	.....	8
Jasper.....	173	47	42	19	23	15	8	5	16	4	.....	.....	.....	.....	.....
Jay.....	621	166	130	110	62	29	29	22	14	10	5	6	4	.....	.....
Jefferson.....	225	68	55	39	16	10	9	8	8	3	3	1	2	.....	4
Jennings.....	238	82	43	60	28	25	18	8	12	.....	.....	.....	.....	.....	3
Johnson.....	261	65	59	42	34	24	17	9	4	.....	.....	.....	.....	.....	.....
Knox.....	1,031	269	205	149	130	86	17	52	25	17	14	3	2	.....	.....
Kosciusko.....	422	120	112	64	50	32	12	12	4	6	8	6	1	.....	1
Lafayette.....	369	90	83	42	44	27	22	18	11	8	9	9	2	.....	2
Lake.....	720	191	154	112	62	50	49	28	25	19	5	8	14	.....	3
Laporte.....	754	215	171	114	93	65	30	11	18	12	9	7	4	.....	5
Leflore.....	579	169	131	80	64	38	32	8	15	13	6	6	4	.....	6
Madison.....	1,436	420	337	205	141	103	90	61	27	20	10	9	4	.....	7
Marion.....	4,177	1,638	1,015	612	406	285	176	110	77	50	46	25	6	.....	38
Marshall.....	495	143	115	65	53	41	28	19	12	7	4	3	3	.....	8
Martin.....	164	33	33	32	16	10	13	8	5	4	4	1	3	.....	1
Miami.....	280	86	57	45	28	22	13	8	9	3	4	3	3	.....	1
Monte.....	391	132	65	61	40	25	17	61	15	6	4	4	4	.....	2
Montgomery.....	566	173	131	89	54	40	34	20	14	3	5	.....	.....	.....	3
Morgan.....	290	64	68	49	31	24	15	9	13	8	.....	.....	.....	.....	3
Newton.....	235	69	50	38	26	12	9	15	11	4	2	3	1	.....	7
Noble.....	349	90	78	54	52	34	15	12	6	3	1	1	1	.....	2
Ohio.....	73	20	9	16	6	7	6	4	3	2	1	1	3	.....	2
Orange.....	245	59	46	14	27	17	26	6	3	1	6	1	2	.....	4
Owen.....	216	62	48	39	28	8	15	9	5	3	1	1	2	.....	.....

TABLE B.—Continued.

COUNTIES.	NUMBER OF CHILDREN BORN TO EACH MOTHER.												
	Total Births.												
	First.	Second	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Ninth.	Tenth.	Eleventh.	Twelfth and Over.	Not Re-ported.
Parke.....	285	52	34	26	14	17	10	7	4	5	3	3	3
Perry.....	337	83	42	35	33	31	20	9	8	6	3	3	2
Pike.....	387	96	46	50	32	38	18	14	8	6	3	2	4
Porter.....	220	51	36	33	17	16	10	8	6	5	1	1	2
Posey.....	441	120	76	61	65	44	34	19	8	6	4	2	2
Pulaski.....	121	34	18	12	7	6	7	6	2	2	2	5	...
Putnam.....	466	124	80	47	35	33	19	9	6	6	6	1	...
Randolph.....	596	168	94	66	40	22	22	18	5	5	7	1	12
Ripley.....	173	54	23	13	5	10	6	5	4	3	1	...	1
Rush.....	289	87	33	36	32	14	11	6	4	2	...	1	1
Scott.....	157	38	26	22	12	6	5	7	1	1	...	...	1
Shelby.....	391	102	63	36	26	23	11	7	6	6	6	1	7
Spencer.....	255	63	48	40	32	18	12	2	6	6	4	3	2
Starke.....	204	52	30	22	15	14	9	5	6	6	...	3	2
Steuben.....	137	54	33	18	10	6	1	2	1	...	...	1	1
St. Joseph.....	1,245	406	181	113	80	62	54	43	13	8	7	9	...
Sullivan.....	308	101	55	35	19	15	4	3	1	...	...	...	1
Switzerland.....	165	53	32	27	8	7	6	8	3	3	...	3	3
Tippicanoe.....	455	150	92	62	47	38	14	19	16	7	4	3	1
Tipton.....	382	110	76	63	31	21	14	11	4	4	...	1	11
Union.....	95	24	20	14	4	5	...	5	2	...	...	...	2
Vanderburgh.....	1,209	368	193	135	91	65	34	30	16	19	4	10	10
Vermillion.....	376	103	88	43	29	25	17	8	2	2	1	2	7
Vigo.....	1,097	338	181	108	75	39	40	27	10	11	4	5	...

Webash.....	489	146	110	74	54	31	28	15	10	7	1	3	2	8
Warren.....	171	61	35	21	18	13	6	8	5	6	3	.....	.....	.....
Warwick.....	298	62	49	53	31	32	20	8	19	7	3	.....	.....	.....
Washington.....	234	63	39	34	27	16	17	15	10	3	3	.....	.....	.....
Wayne.....	735	240	190	87	60	46	37	18	11	17	3	.....	.....	.....
Wells.....	384	129	76	52	40	30	23	10	11	4	2	.....	.....	.....
White.....	424	188	83	78	48	40	30	16	16	12	4	.....	.....	.....
Whitley.....	182	42	52	30	25	8	5	9	4	2	1	.....	.....	.....
Total.....	41,114	12,982	9,641	6,597	4,702	3,227	2,339	1,569	1,117	656	429	242	281	312

TABLE B.—Continued.

Births, Number of Children Born to Each Mother, Grouped Ages of Parents, Still, Plurality and Illegitimate Births, Year Ending December 31, 1905.

COUNTIES.	GROUPED AGES OF PARENTS.														Still-births.		Plurality Births.		Illegitimate Births.	
	Under 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		Not Rep'd.		Males.	Females.	Males.	Females.
	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.				
Adams.....	2	82	202	223	141	80	44	4	2	18	2	3	48	5	3	9	2	4	1	12
Allen.....	4	76	473	631	486	418	206	64	7	10	2	10	48	48	48	48	4	11	7	12
Bartholomew.....	6	55	203	273	190	131	60	22	8	15	1	4	10	13	10	13	4	3	8	5
Benton.....	1	19	96	122	91	69	34	15	8	15	1	4	6	6	4	6	4	2	3	11
Blackford.....	10	73	228	254	161	111	56	23	7	7							6	2	3	
Boone.....	9	72	255	294	174	130	68	21	8	21							4	3	3	11
Brown.....	2	10	45	61	51	45	18	6	3	3	1						11	4	3	3
Carroll.....	1	32	151	203	134	104	56	15	4	15	1	4	1	1	4	1	10	3	2	3
Cass.....	6	22	180	223	127	107	47	17	6	16	3	4	16	2	16	2	2	9	5	1
Clark.....	1	33	164	207	163	120	43	19	13	19	1	6	2	2	6	2	12	2	4	5
Clay.....	5	48	203	275	209	153	76	30	11	30	1	5	2	1	2	1	6	4	4	5
Clinton.....	8	60	232	292	163	143	83	25	11	25	2	5	5	4	5	4	7	6	6	5
Crawford.....	18	83	78	82	35	37	17	23	1	23	2	1					12	18	3	7
Davies.....	3	50	294	382	289	241	87	31	17	31	2	9	1	1	16	3	6	4	4	1
Dearborn.....	3	29	183	176	151	134	61	29	6	29	1	6					6	4	4	5
Decatur.....		31	154	193	118	103	61	17	5	17	2	5					6	2	2	2
DeKalb.....	2	27	121	151	119	84	24	6	1	6		1	10	1	10	1	7	3	1	2
Delaware.....	16	130	496	639	437	302	127	42	16	42	1	23	3	3	23	3	19	7	15	12
Dubuque.....	2	20	94	145	138	115	55	18	8	18		1	8		1		4	7	3	1
Elkhart.....	5	59	279	363	244	177	86	22	5	22		21	13	13	21	13	5	6	5	6

Fayette	117	149	94	68	34	9	5	1	1	1	2	2	9	4	3	3	3	1
Floyd	152	233	176	122	57	22	6	1	6	7	5	5	3	1	1	5	5	1
Fountain	145	178	123	94	55	16	8	1	7	7	7	7	3	4	3	3	3	1
Franklin	81	96	83	78	26	10	3	1	23	2	1	1	5	5	5	5	5	1
Fulton	143	143	86	78	31	9	6	1	1	1	1	1	1	1	1	1	1	1
Gibson	280	356	218	190	96	28	9	2	1	7	17	10	15	7	3	3	3	4
Grant	333	309	289	178	81	98	23	8	1	1	12	6	5	7	5	5	5	4
Greene	255	286	158	120	59	22	17	1	1	1	11	4	5	8	4	4	4	3
Hamilton	241	262	143	140	67	20	11	1	7	1	12	4	4	4	4	4	4	3
Hancock	172	215	138	94	56	22	11	1	1	1	1	3	2	2	3	3	3	3
Harrison	140	174	104	89	41	28	12	2	5	5	2	2	5	3	3	3	3	3
Hendricks	167	220	152	107	53	20	6	2	8	8	2	10	6	6	6	6	6	3
Henry	222	268	176	142	63	17	1	2	19	19	3	8	4	4	4	4	4	3
Howard	233	283	176	137	67	22	19	2	9	9	5	5	1	1	1	1	1	3
Huntington	304	359	211	175	84	24	17	1	7	7	1	6	6	7	7	7	7	1
Jackson	227	304	219	168	74	32	12	1	8	8	2	16	7	9	9	9	9	3
Jasper	75	89	66	44	23	11	1	1	7	7	1	16	7	12	12	12	12	7
Jay	283	339	224	167	74	32	11	4	6	6	1	1	2	3	3	3	3	1
Jefferson	80	120	90	70	34	13	8	1	1	1	1	1	4	2	2	2	2	1
Jennings	101	151	123	95	54	18	4	1	1	1	1	1	1	1	1	1	1	1
Johnson	133	150	85	64	31	17	7	1	3	3	7	6	4	9	9	9	9	1
Knox	422	523	403	325	165	42	26	1	17	17	3	15	4	15	15	15	15	8
Kosciusko	169	220	155	122	63	25	9	1	17	17	7	3	4	4	4	4	4	2
Lagrange	155	184	127	108	48	32	22	3	1	1	3	8	6	7	7	7	7	1
Lake	247	370	322	246	123	39	12	2	7	7	3	5	6	11	11	11	11	3
Johnson	133	150	85	64	31	17	7	1	3	3	7	6	4	9	9	9	9	1
Laporte	319	434	290	209	113	43	19	1	12	12	1	21	8	3	3	3	3	4
Lawrence	286	286	181	133	64	22	28	1	46	46	37	5	5	3	3	3	3	6
Madison	686	744	512	364	161	102	28	4	14	14	13	14	13	9	9	9	9	6
Marion	1,393	2,459	1,703	1,248	480	135	40	6	170	170	60	68	48	68	68	68	68	82
Marshall	278	278	194	147	69	20	13	1	1	1	1	1	1	3	3	3	3	4
Martin	70	85	61	56	23	7	5	1	15	15	10	5	3	4	4	4	4	1
Miami	111	163	104	67	41	11	6	1	1	1	5	2	2	1	1	1	1	3
Monroe	185	211	132	106	73	19	15	2	4	4	4	11	3	4	4	4	4	3
Montgomery	245	307	222	168	73	17	15	1	1	1	4	10	7	7	7	7	7	3
Morgan	133	163	99	83	36	9	5	1	1	1	1	3	3	3	3	3	3	3
Newton	91	124	78	55	30	10	6	1	21	21	19	6	3	5	5	5	5	1
Noble	147	173	131	125	59	11	6	1	5	5	1	7	6	1	1	1	1	3
Ohio	17	182	87	57	27	4	2	1	11	11	6	1	1	3	3	3	3	1
Orange	100	132	87	70	41	15	6	1	1	1	1	4	1	8	8	8	8	2
Owen	100	123	68	53	26	9	3	1	15	15	8	4	1	1	1	1	1	5

TABLE B.—Continued.

COUNTIES.	GROUPED AGES OF PARENTS.												Still-births.		Plurality Births.		Illegitimate Births.				
	Under 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.								70 to 80.		
	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Males.	Females.	Males.	Females.					
Park.	2	16	100	125	90	80	37	12	3	.....	.....	.....	.....	1	7	3	3	2	2	2	7
Perry.	1	36	134	175	134	107	49	16	12	.....	.....	.....	.....	2	10	4	4	5	3	3	4
Pike.	5	40	153	205	158	114	48	17	9	.....	.....	.....	.....	5	11	3	3	5	3	3	6
Porter.	1	11	105	117	60	68	35	20	13	.....	2	.....	.....	6	8	3	3	11	3	3	4
Poscy.	5	41	170	239	189	137	59	19	9	.....	.....	.....	.....	2	5	9	3	2	5	5	6
Pulaski.	4	22	35	45	52	35	20	17	7	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Putnam.	4	49	193	237	178	153	69	20	7	.....	.....	.....	.....	1	7	6	6	5	7	3	1
Randolph.	16	66	303	345	180	152	72	23	7	.....	.....	.....	.....	3	10	10	5	10	3	6	3
Ripley.	3	19	69	84	68	48	31	12	1	.....	.....	.....	.....	8	7	3	3	8	3	1	1
Rush.	1	25	133	165	98	86	47	12	7	.....	.....	.....	.....	2	5	2	2	2	5	3	.....
Scott.	3	21	62	78	65	43	17	6	2	.....	.....	.....	.....	4	1	1	1	4	2	2	2
Shelby.	5	39	167	212	146	111	49	19	10	.....	.....	.....	.....	9	5	5	5	4	4	4	.....
Spencer.	2	26	91	120	95	82	42	12	3	.....	.....	.....	.....	17	8	2	2	17	5	3	2
Starke.	2	21	88	101	69	60	37	19	2	.....	.....	.....	.....	1	2	2	2	1	2	2	.....
Steuben.	3	15	57	66	48	42	16	3	4	.....	.....	.....	.....	8	2	2	2	10	2	.....	.....
St. Joseph.	10	109	507	686	523	376	152	54	22	.....	.....	.....	.....	18	3	3	3	7	16	6	6
Sullivan.	1	101	225	128	46	14	10	1	1	.....	.....	.....	.....	23	3	3	3	23	10	2	1
Switzerland.	.....	14	67	76	56	60	30	8	2	.....	.....	.....	.....	8	5	5	5	5	2	2	2
Tippecanoe.	7	42	171	212	173	142	84	31	4	.....	.....	.....	.....	1	9	5	5	7	2	2	2
Tipton.	14	76	204	199	103	88	42	7	5	.....	.....	.....	.....	7	6	4	4	5	8	2	1
Union.	4	42	56	66	40	30	11	5	2	.....	.....	.....	.....	6	9	6	4	6	8	2	1
Vanderburgh.	.....	14	95	641	493	392	165	65	26	.....	.....	.....	.....	12	20	9	9	12	10	12	20
Vermillion.	6	39	148	187	122	93	52	18	5	.....	.....	.....	.....	36	11	3	5	36	7	2	2
Vigo.	15	128	509	562	369	290	149	36	23	.....	.....	.....	.....	19	32	29	4	19	32	16	16

Wabash.....	3	48	194	231	177	143	70	34	16	1	2	20	26	6	1	9	5	5	4
Warren.....	1	23	173	124	64	54	24	4	1	1	.....	1	1	2	2	2	.....	.....	2
Warwick.....	27	8	137	126	86	86	18	30	3	2	.....	3	43	2	1	3	3	.....	1
Washington.....	2	22	91	117	91	82	41	11	5	.....	.....	2	.....	1	.....	1	3	.....	.....
Wayne.....	13	60	396	403	267	227	102	31	8	.....	3	13	11	13	5	3	4	.....	6
Wells.....	10	76	185	178	120	146	78	13	7	.....	.....	8	2	3	.....	7	5	.....	3
White.....	10	33	130	212	169	140	72	31	2	.....	3	1	30	4	.....	5	2	.....	3
Whitley.....	3	14	89	100	64	56	19	6	2	.....	.....	5	6	4	1	.....	2	.....	.....
Total.....	630	4,834	19,008	23,451	16,289	12,668	5,830	2,063	833	15	104	14	971	650	670	449	393	431	372

TABLE B.—Continued.

COUNTIES.	GROUPED AGES OF PARENTS.												Still-births.		Plurality Births.		Illegitimate Births.		
	Under 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		Not Rep'd.		Males.	Females.	
	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Fathers.	Mothers.	Males.	Females.			
Parke	2	16	100	125	90	80	37	12	3	..	..	..	..	..	1	7	3	1	2
Perry	1	36	134	175	134	107	49	16	12	..	..	..	..	..	2	10	4	4	3
Pike	5	40	153	205	158	114	48	17	9	..	..	..	..	..	5	3	3	1	2
Porter	1	11	105	117	60	68	85	20	13	..	2	..	..	..	6	5	9	4	3
Posey	5	41	170	239	189	137	59	19	9	..	..	..	..	..	2	5	9	4	3
Pulaski	4	22	35	45	52	35	20	17	7	..	1	..	..	..	1	7	6	7	6
Putnam	4	49	193	237	178	153	69	20	7	..	3	..	..	..	1	10	10	3	3
Randolph	16	66	303	345	180	152	72	23	7	..	8	..	..	..	2	3	2	11	6
Ripley	3	19	69	84	68	48	31	12	1	1	1	..	..	..	8	3	3	3	1
Rush	1	25	133	165	98	86	47	12	7	..	..	..	..	..	2	5	5	1	1
Scott	3	21	62	78	65	43	17	9	2	..	1	..	..	..	4	1	1	4	2
Shelby	5	39	167	212	146	111	49	19	10	1	..	..	..	..	9	5	2	5	2
Spencer	2	26	91	120	95	82	42	12	3	..	2	..	..	..	17	8	2	5	3
Starke	2	21	88	101	69	60	37	19	2	..	..	..	..	..	8	2	2	2	2
Steuben	3	15	57	66	48	42	16	3	4	1	1	..	..	..	10	2	2	4	..
St. Joseph	10	109	507	686	523	376	152	54	22	..	..	..	..	..	18	7	3	16	6
Sullivan	1	101	225	228	44	46	14	10	1	..	..	..	..	..	23	3	3	2	1
Switzerland	..	14	67	76	56	60	30	8	2	..	..	..	..	..	8	5	5	2	2
Tippecanoe	7	42	171	232	173	142	84	31	4	1	1	1	1	..	7	9	5	2	2
Tipton	14	76	204	199	103	88	42	7	5	..	..	..	..	..	5	6	4	8	1
Union	4	42	80	56	40	30	11	5	2	..	..	..	..	..	6	9	6	8	2
Vanderburgh	14	95	486	641	493	382	165	65	26	..	3	..	..	..	12	20	9	10	12
Vermillion	6	39	148	187	122	93	52	18	5	..	1	..	..	..	36	11	3	5	9
Vigo	15	128	509	562	369	290	149	36	23	..	6	..	..	..	19	29	4	10	16

Webach.....	3	48	194	231	177	143	70	34	16	2	.....	20	26	6	1	9	5	5	4
Warren.....	1	23	73	84	64	57	24	4	7	1	.....	1	1	2	2	2	2	2	2
Warwick.....	27	8	157	126	86	86	18	30	3	2	.....	3	43	2	2	3	3	3	1
Washington.....	2	22	91	117	91	82	41	11	5	.....	.....	2	.....	1	1	1	3	3	.....
Wayne.....	13	60	396	403	287	227	102	31	8	3	.....	13	11	13	5	3	3	4	6
Wells.....	10	75	185	178	120	109	48	13	7	.....	.....	8	2	3	2	7	5	9	3
White.....	1	33	130	212	169	140	72	31	2	3	.....	30	1	4	4	5	5	2	3
Whitley.....	3	14	89	100	64	56	19	6	2	.....	5	6	.....	4	1	.....	2	2	.....
Total.....	630	4,834	19,008	23,451	16,289	12,068	5,830	2,063	835	15	104	14	630	670	470	449	393	431	372

TABLE C.

Marriages by Months, Color and Nationality, Year Ending December 31, 1905.

COUNTIES.	1905.												Color.		NATIONALITY.						Total.		
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Grooms.	Brides.	Grooms.	Brides.	Not Reported.				
																			Grooms.	Brides.		Grooms.	Brides.
Adams.....	19	13	16	10	20	25	18	21	27	23	17	24	233	7	218	212	15	21	.....	.....	233
Allen.....	67	52	60	19	47	101	66	40	67	69	78	94	743	2	684	696	66	53	.....	1	750	
Bartholomew.....	16	16	11	23	14	20	18	16	26	21	27	19	225	.....	221	207	5	.....	1	.....	227
Benton.....	8	11	12	9	9	9	4	6	6	12	8	14	108	.....	105	107	8	.....	.....	.....	108
Blackford.....	18	7	12	20	11	14	10	10	21	22	18	28	188	3	182	182	9	9	.....	.....	191
Boone.....	20	27	27	14	11	16	9	8	16	27	18	34	227	.....	226	226	.....	.....	1	1	227
Brown.....	19	5	6	15	3	6	3	7	5	5	8	13	95	.....	95	95	.....	.....	.....	.....	95
Carroll.....	18	10	14	12	9	9	7	13	10	20	25	21	168	.....	165	166	3	2	.....	.....	168
Cass.....	34	18	17	31	18	21	28	31	23	33	33	23	310	.....	287	296	23	13	.....	1	310
Clark.....	53	36	46	37	40	41	41	58	56	79	83	70	532	108	626	632	14	7	.....	1	640	
Clay.....	50	15	23	24	19	19	31	21	20	44	29	25	334	1	316	320	19	15	.....	.....	335
Clinton.....	20	17	24	17	18	26	14	23	34	31	37	39	300	.....	298	300	2	.....	.....	.....	300
Crawford.....	8	12	8	12	10	10	6	12	10	9	7	12	114	.....	84	89	20	17	10	8	114	
Davies.....	31	23	29	27	18	20	15	11	12	28	19	29	265	1	264	265	2	2	.....	.....	266
Dearborn.....	22	17	14	23	22	38	15	11	12	22	15	21	229	3	222	227	10	5	.....	.....	233
Decatur.....	15	17	20	11	13	18	8	16	20	19	8	21	184	2	186	185	.....	1	.....	.....	186
Dekalb.....	32	15	21	8	10	10	10	13	26	8	28	29	222	.....	200	200	7	7	15	15	222	
Delaware.....	69	50	33	82	33	36	64	32	70	64	64	49	580	12	561	578	11	11	.....	3	592	
Dubois.....	6	10	5	10	26	15	10	12	18	26	10	5	153	.....	163	153	.....	.....	.....	.....	153
Elkhart.....	82	28	39	54	22	40	33	26	29	62	45	38	497	1	468	472	24	20	6	6	498		

Fayette	6	10	18	9	7	4	5	9	8	8	7	6	10	86	3	89	88	1	8	7	89
Floyd	12	18	16	24	25	23	28	23	36	25	28	10	281	22	288	275	10	.....	4	.....	.....	.....	286
Fountain	20	21	12	6	9	15	6	13	17	14	13	26	166	.....	163	164	3	.....	2	.....	.....	.....	166
Franklin	11	11	17	2	11	19	5	13	17	17	11	26	128	.....	128	128	3	.....	.....	.....	.....	.....	128
Fulton	12	11	15	21	13	11	8	9	13	13	12	18	156	.....	154	166	2	.....	.....	.....	.....	.....	156
Gibson	9	10	19	22	12	19	19	32	21	22	31	37	282	12	243	244	1	.....	.....	.....	.....	.....	244
Grant	68	50	41	57	38	61	25	32	42	2	11	57	453	31	436	437	48	.....	.....	.....	.....	.....	484
Greene	35	23	12	43	23	28	20	36	36	33	37	64	353	.....	353	353	1	.....	.....	.....	.....	.....	353
Hamilton	18	25	19	37	16	16	17	25	21	28	30	35	279	9	284	287	4	.....	.....	.....	.....	.....	288
Hancock	14	13	15	18	15	20	14	13	21	17	17	30	205	2	205	207	2	.....	.....	.....	.....	.....	207
Harrison	18	15	16	16	11	16	16	18	21	16	10	9	15	179	.....	179	179	.....	.....	.....	.....	.....	179
Hendricks	18	11	10	12	11	16	8	21	16	29	10	12	166	2	166	167	1	.....	.....	.....	.....	.....	168
Henry	28	17	17	27	8	18	18	16	16	30	9	30	226	8	233	234	1	.....	.....	.....	.....	.....	234
Howard	22	29	23	36	20	31	20	26	26	40	18	25	312	4	305	302	11	.....	.....	.....	.....	.....	316
Huntington	14	17	23	35	20	12	17	23	23	28	23	24	259	.....	258	257	1	.....	.....	.....	.....	.....	259
Jackson	16	19	22	23	11	24	11	17	25	31	16	27	240	2	239	240	3	.....	.....	.....	.....	.....	242
Jasper	11	3	12	10	20	4	5	11	8	7	8	12	111	.....	92	102	9	.....	.....	.....	.....	.....	111
Jay	25	15	21	20	21	23	21	16	30	22	23	30	259	5	263	258	1	.....	.....	.....	.....	.....	264
Jefferson	15	12	22	18	20	23	18	9	19	16	2	5	182	8	187	188	2	.....	.....	.....	.....	.....	180
Jennings	12	6	6	22	9	7	9	11	5	25	13	3	126	2	128	128	.....	.....	.....	.....	.....	.....	128
Johnson	8	15	20	19	9	15	10	13	8	15	17	17	164	2	163	166	3	.....	.....	.....	.....	.....	166
Knox	24	30	27	44	22	16	20	28	32	19	36	37	329	6	324	333	9	.....	.....	.....	.....	.....	335
Kosciusko	24	24	23	15	22	19	24	13	22	27	31	24	274	.....	271	274	3	.....	.....	.....	.....	.....	274
Lagrange	14	10	10	7	4	11	8	9	12	12	9	16	122	.....	119	121	3	.....	.....	.....	.....	.....	122
Lake	58	67	67	66	61	80	96	88	106	91	89	71	924	16	637	643	239	.....	.....	.....	.....	.....	940
Laporte	31	22	17	35	19	25	18	19	28	28	35	31	307	1	264	273	43	.....	.....	.....	.....	.....	308
Lawrence	16	21	12	39	13	12	22	13	25	24	21	18	226	.....	226	226	2	.....	.....	.....	.....	.....	226
Madison	57	48	35	70	51	69	56	56	49	64	77	90	691	22	683	697	30	.....	.....	.....	.....	.....	713
Marion	316	164	112	192	170	235	205	191	196	289	214	280	2,216	348	2,381	2,401	181	.....	.....	.....	.....	.....	2,564
Marshall	9	19	15	25	11	12	15	16	24	19	20	20	204	1	194	203	11	.....	.....	.....	.....	.....	205
Martin	8	4	5	5	12	6	3	16	15	9	13	13	100	.....	100	100	27	.....	.....	.....	.....	.....	100
Miami	16	25	19	19	18	22	15	16	30	31	33	27	269	2	216	217	27	.....	.....	.....	.....	.....	271
Monroe	18	13	27	29	10	23	23	23	19	23	22	19	224	4	228	228	23	.....	.....	.....	.....	.....	228
Montgomery	16	16	15	25	14	21	19	22	28	28	30	31	267	11	243	245	2	.....	.....	.....	.....	.....	278
Morgan	16	16	14	19	9	22	7	16	9	19	25	27	169	.....	169	199	.....	.....	.....	.....	.....	.....	199
Newton	5	7	14	9	4	9	5	5	5	9	5	12	93	.....	86	88	6	.....	.....	.....	.....	.....	93
Noble	11	15	15	20	17	19	7	8	19	19	23	22	185	.....	180	192	6	.....	.....	.....	.....	.....	195
Ohio	2	5	5	3	2	2	3	2	6	2	5	12	53	.....	49	49	4	.....	.....	.....	.....	.....	53
Orange	15	7	10	10	12	8	12	13	9	25	7	11	143	1	.....	.....	.....	.....	.....	.....	.....	.....	144
Owen	36	18	20	5	5	4	6	5	8	13	7	11	138	.....	138	138	.....	.....	.....	.....	.....	.....	138

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1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Wabash.....	21	12	12	23	17	13	18	15	11	34	23	17	215	208	209	7	3	3	215
Warren.....	6	13	16	2	8	5	6	2	12	7	6	13	96	96	95	1	96
Warrick.....	23	12	9	25	14	11	10	19	8	12	19	18	180	180	180	.....	.....	.....	180
Washington.....	11	9	10	14	11	11	11	14	24	21	12	24	172	172	172	.....	.....	.....	172
Wayne.....	29	24	24	26	21	26	13	25	29	37	31	40	305	317	324	8	.....	1	325
Wells.....	17	15	29	12	10	9	16	18	29	19	22	30	26	224	226	.....	2	.....	226
White.....	17	17	8	16	4	4	11	6	9	13	15	25	145	50	50	.....	95	.....	145
Whitley.....	24	11	15	15	11	11	9	13	13	13	9	24	168	164	163	4	.....	.....	168
Total.....	2,450	1,846	1,823	2,233	1,662	2,072	1,860	1,926	2,133	2,626	2,325	2,654	21,706	23,709	23,963	1,521	1,245	380	25,610

TABLE D.
Marriages, Grouped Ages, for the Year Ending December 31, 1905.

COUNTIES.	Under 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and Over.		Not Reported.		Total.
	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	
Adams.....	1	91	175	119	44	21	11	2	20	11	8	3	2	2	1	2	1	233	
Allen.....	9	124	516	490	160	94	34	25	7	3	2	2	2	2	1	1	3	750	
Bartholomew.....	14	62	147	129	41	19	14	14	1	2	1	1	2	2	1	4	3	227	
Benton.....	1	25	75	68	25	10	3	3	1	2	1	1	1	1	1	1	1	108	
Blackford.....	7	53	131	107	29	16	13	6	5	5	1	1	2	2	1	1	3	191	
Boone.....	17	85	156	108	32	21	7	4	5	5	6	3	3	3	1	1	1	227	
Brown.....	6	39	60	40	24	17	5	6	4	2	2	2	1	1	1	1	1	95	
Carroll.....	3	34	113	111	36	16	11	4	1	2	1	1	3	3	1	1	2	168	
Cass.....	13	70	221	201	48	29	17	5	1	3	1	2	7	1	1	1	3	310	
Clark.....	4	136	432	396	134	75	44	22	17	9	8	2	1	1	1	1	1	640	
Clay.....	8	95	236	200	58	24	20	9	10	6	2	1	1	1	1	1	1	335	
Clinton.....	11	79	213	179	44	21	19	14	7	4	5	4	1	1	1	1	4	300	
Crawford.....	52	51	22	36	23	9	8	8	4	5	4	1	1	1	1	1	1	114	
Davies.....	6	73	194	147	35	27	18	12	6	5	7	2	2	2	1	1	1	266	
Dearborn.....	2	57	150	124	49	36	16	9	7	5	8	1	1	1	1	1	1	232	
Decatur.....	5	43	125	111	37	21	9	5	7	4	3	1	3	3	1	1	1	166	
Dekalb.....	3	55	161	126	29	24	11	8	10	4	4	3	1	1	1	1	1	222	
Delaware.....	18	154	401	346	108	56	37	23	14	6	9	5	4	4	1	1	1	592	
Dubois.....	3	34	120	110	26	7	2	1	1	1	1	1	1	1	1	1	1	153	
Elkhart.....	4	98	358	318	77	47	25	17	18	10	9	5	6	3	1	1	1	498	
Fayette.....	6	19	66	59	11	8	4	1	1	1	1	4	3	3	1	1	1	89	
Floyd.....	2	51	176	168	68	40	19	9	7	6	4	2	2	2	1	1	7	286	
Fountain.....	12	45	109	94	26	18	11	5	2	1	2	2	1	1	1	1	2	166	
Franklin.....	1	19	93	95	27	8	3	2	4	4	2	2	2	1	1	1	1	128	
Fulton.....	3	33	100	95	31	14	10	9	5	4	2	1	4	4	1	1	1	156	

Gibson.....	9	62	182	138	48	24	10	7	7	3	6	7	1	1	1	3	244
Grant.....	18	226	191	141	71	48	20	17	11	7	7	7	4	4	16	484	
Greene.....	71	218	186	38	22	14	10	8	4	7	7	1	1	1	1	353	
Hamilton.....	9	73	211	41	18	10	10	7	8	3	1	1	2	2	1	288	
Hancock.....	10	52	138	39	22	13	5	6	8	1	6	1	1	1	1	207	
Harrison.....	5	32	113	43	26	14	6	4	2	1	4	1	1	1	2	179	
Hendricks.....	3	41	114	32	17	8	7	6	5	4	6	1	1	1	1	168	
Henry.....	5	59	163	34	23	11	13	11	5	9	11	3	1	1	1	234	
Howard.....	7	80	194	65	46	26	10	15	12	5	15	7	1	1	1	316	
Huntington.....	10	67	180	40	24	14	9	10	6	7	10	1	1	1	1	259	
Jackson.....	4	64	168	46	17	12	9	7	2	3	7	1	2	1	1	242	
Jasper.....	4	29	72	32	13	6	2	4	3	3	4	1	1	1	1	111	
Jay.....	4	85	192	38	15	19	8	7	3	3	7	1	1	1	1	264	
Jefferson.....	3	54	120	42	22	11	10	10	9	4	7	1	3	1	1	190	
Jennings.....	3	25	84	24	14	9	9	10	3	1	10	1	1	1	1	128	
Johnson.....	4	38	101	42	17	10	6	6	5	2	6	1	1	1	1	166	
Knox.....	12	105	227	58	38	24	15	8	2	6	8	1	1	1	1	335	
Kosciusko.....	3	69	205	38	20	11	14	4	5	11	4	1	1	1	1	274	
Lagrange.....	7	37	89	68	14	9	5	2	3	2	4	1	2	2	1	122	
Lake.....	4	183	511	255	155	97	64	28	9	14	28	1	2	2	1	940	
Laporte.....	3	77	214	60	32	22	13	5	4	2	5	1	2	1	1	308	
Lawrence.....	9	67	160	39	22	9	7	6	2	3	7	1	1	1	1	226	
Madison.....	37	203	451	133	74	48	24	18	13	2	18	1	1	1	1	713	
Marion.....	50	360	1,495	555	338	176	144	75	38	31	11	5	3	5	21	2,564	
Marshall.....	3	43	135	98	20	15	11	10	2	4	10	1	6	1	177	205	
Martin.....	1	31	63	19	10	9	5	3	1	2	3	1	2	1	2	100	
Miami.....	3	60	192	46	26	19	6	5	5	3	6	1	3	2	2	271	
Monroe.....	8	71	158	40	22	9	9	8	6	3	9	1	1	1	1	228	
Montgomery.....	6	61	164	42	31	13	7	10	5	7	7	1	1	1	84	278	
Morgan.....	4	45	131	127	44	15	7	3	1	4	15	1	2	1	1	149	
Newton.....	1	25	63	20	9	7	2	1	1	1	1	1	1	1	1	93	
Noble.....	3	36	126	40	21	9	8	8	2	5	8	1	2	2	2	195	
Ohio.....	1	16	41	6	8	4	7	1	1	1	1	1	1	1	1	53	
Orange.....	1	43	109	21	9	6	6	4	2	4	4	1	1	1	1	144	
Owen.....	3	37	100	19	15	7	6	3	6	4	3	1	1	1	2	138	
Parke.....	6	48	130	26	12	12	5	2	6	8	2	1	1	1	1	186	
Perry.....	4	42	131	28	11	5	3	1	6	1	3	1	2	1	1	173	
Pike.....	4	64	121	23	18	10	3	3	2	4	4	1	1	1	1	167	
Porter.....	1	26	124	30	16	7	4	5	2	1	5	1	1	1	1	169	
Posey.....	6	64	132	45	24	19	14	6	2	8	1	1	1	1	2	219	
Pulaski.....	3	50	111	25	3	7	7	5	4	6	8	1	1	1	2	96	
Putnam.....	7	80	58	37	20	14	6	6	7	7	7	1	2	1	2	190	
Randolph.....	36	152	110	80	16	8	6	3	3	4	7	1	2	1	2	256	

TABLE D.—Continued.

COUNTIES.	Under 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 and Over.		Not Reported.		Total
	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	
Ripley	2	27	76	68	26	10	3	5	2	1	2	1	1	1	146	146	146	146	146
Rush	3	22	41	35	13	9	10	1	2	3	1	1	1	1	12	12	12	12	12
Scott	11	81	180	160	62	25	14	13	4	4	11	1	1	1	70	70	70	70	70
Shelby	1	39	142	131	38	20	8	3	1	1	3	1	1	1	287	287	287	287	287
Spencer															183	183	183	183	183
Stark	1	27	61	46	13	4	4	2	2	3	1	1	1	1	82	82	82	82	82
Steuben	5	24	92	81	19	19	8	9	17	11	7	4	4	2	137	137	137	137	137
St. Joseph	6	165	608	537	162	105	62	40	17	11	7	4	4	3	6	6	6	6	6
Sullivan	1	137	288	150	45	47	20	16	6	11	4	3	1	1	361	361	361	361	361
Switzerland	1	17	47	41	13	5	1	2	4	4	3	1	1	1	69	69	69	69	69
Tipton	4	76	222	203	79	44	22	16	13	6	10	8	4	4	359	359	359	359	359
Tipton	12	73	133	116	26	14	2	1	3	4	4	2	1	1	181	181	181	181	181
Union	1	13	35	28	10	2	1	1	1	1	1	1	1	1	43	43	43	43	43
Vanderburgh	12	112	523	544	193	108	54	38	23	12	12	2	1	1	920	920	920	920	920
Vermillion	3	32	99	87	19	10	8	3	5	3	1	1	1	1	136	136	136	136	136
Vigo	37	202	468	462	254	175	89	36	21	8	5	2	1	1	889	889	889	889	889
Wabash	6	63	158	126	80	14	10	6	4	4	4	2	3	3	215	215	215	215	215
Warren	8	31	72	55	15	7	1	2	4	3	1	1	1	1	96	96	96	96	96
Warrick	7	45	114	101	37	23	11	7	8	3	2	2	1	1	180	180	180	180	180
Washington	15	63	116	86	19	9	8	4	8	4	2	2	1	1	172	172	172	172	172
Wayne	5	59	205	187	48	36	29	19	14	9	9	5	7	7	395	395	395	395	395
Wells	11	85	161	142	34	14	8	3	7	2	1	1	1	1	226	226	226	226	226
White	4	42	107	85	22	14	9	2	1	1	3	1	1	1	145	145	145	145	145
Whitley	4	48	116	92	33	20	9	5	2	1	2	1	1	1	168	168	168	168	168
Total	749	6,174	16,713	14,599	4,898	2,787	1,583	995	676	409	384	149	125	27	7	3	475	467	25,610

**CHART SHOWING GEOGRAPHICAL DISTRIBUTION OF DEATHS FROM CERTAIN
COMMUNICABLE DISEASES FOR THE YEAR 1905.**

APPENDIX.

The papers here given were read before health officers' schools, which were held under the auspices of the State Board of Health.

STREAM POLLUTION AND REMEDIAL POLICY.

MARSHALL O. LEIGHTON, U. S. HYDROGRAPHER.

If I were more familiar with the conditions which prevail in Indiana rivers, I might discuss the question of pollution with points of application at short range. But as my information is largely indirect, it will be necessary for me to draw from the results of a broad and general observation, and leave you to reconcile the principles which I shall endeavor to uphold, to the conditions as you see them in your State.

It is especially significant that an association of engineers should have a standing committee appointed to consider stream pollution, and should become interested in the subject sufficiently to consider remedial measures. Only a few years ago the subject would have been considered solely in the realm of the physician and sanitarian, and basis for agitation would have been the public health. What, then, is the professional interest which induces this society to give heed to these matters?

The hygienic significance of river pollution has grown very narrow. In former years, when we conceived that the plague and the pestilence lurked in fetid vapors, in foul odors, in miasmas and effluvia, a polluted stream was logically a thing for sanitarians to conjure with. But gradually our beliefs have been changed, and we have found by progressive steps that our health is less in danger from foul water, until now it is conceded that, in order that a person may be injured by it, he must actually pour it into his mouth and swallow it. Therefore the only feature of stream pollution which remains of professional interest to the sanitarian, is that of the protection of waters used for domestic supply.

We shall find that the reasons which make stream pollution undesirable are economical ones. Water is a source of wealth, the

magnitude of which appears greater and greater the more we ponder upon the subject. It will not be necessary for me to review before this company the special lines of utilization to which water is applied. You know the importance of conserved water in power development, in city supply, in ice supply, in irrigation and in fisheries. You will appreciate, also, that in many of these lines of special development, polluted water can not be safely used; therefore, pollution is a damage to natural water resources. An engineer is, above all things, one who preserves and develops natural resources, and therefore the consideration of river pollution is, of right, one of the duties of an engineering society.

You have taken up the study of river pollution with the purpose in view of applying, or assisting in the application of remedial measures. It is, or should be, a conquest in which you have a definite plan of campaign, the issues of which are logical and definite, and the points of attack the most vulnerable that can be found. Wasted effort before an impregnable barrier is heroic while it lasts, and highly entertaining to the spectators. More creditable it is to seek out your opponents' weak points, and thereby bring about a few results.

For years we have been preaching the gospel of sanitation to our legislators and our makers of history; we have upheld in glowing rhetoric divers humanitarian principles, we have pointed to the bodies of the dead, have echoed the wails of the suffering, and we have been laughed at for our pains. If you will glance about the world you will see wonderful improvements in all matters pertaining to the physical health and comfort of the human race; this is readily admitted; but how much of this, think you, would have been brought about if health and comfort had alone been considered? Do you know of a city in this broad land that has installed a system of water filtration because of the sufferings of its inhabitants? Those which I have been familiar with have been constructed because the poor water and high death rate resulted in a bad reputation abroad, in decreased business and drops in real estate. You may bellow at a city until you are black in the face, but no change will come until some one's pocketbook is hit. In your own State of Indiana your health officers have been insulted and scorned in their efforts to save lives, and they have

rarely or never had any support or decent treatment until the conditions which they were combating grew formidable enough to hurt business.

Therefore, I counsel you in your struggle against stream pollution, to avoid the subject health and sanitation. Meet this mercenary state of society with a mercenary argument; talk dollars and cents, even if you are reduced to a consideration of the pecuniary value of lives lost in an epidemic. You will always have an audience under such circumstances, and you can make it move with a few calculations based upon loss in the coin of the realm, for it is money that makes social, commercial, and sometimes legislative wheels go round. If you take up a foul stream for discussion and calculate the value of the water in its pure state, as a source of water and ice supply, as a means of developing power, as a useful agent in manufacturing, as a home for fish, and as an agent in enhancing the value of real estate, you can produce a column of figures that will make anyone interested. Then if you calculate the amount of damage, in dollars and cents, wrought upon water and ice supply, if you figure up the thousands of pounds of dead fish, if you show a picture of corroded boilers and of ruined manufactured articles, and give a hint as to how much it cost the manufacturer to replace that foul water with a pure supply; and, finally, if you figure up the losses due to decline in real estate in the vicinity of this foulness, you will meet a response from your audience that will gratify you beyond your expectations.

Let us now consider the concrete subject of pollution. It has been found convenient to divide the subject into three classes, each based upon the source from which the contaminating matter arises: First, the natural pollution, which must, of necessity, be carried into streams along with the water from occupied lands or tiled fields, irrespective of any drains which may enter the stream; second, household sewage, consisting of the excrements from man and the refuse occurring in his domestic economy; third, wastes from industries. Taking for consideration any stream which flows through Indiana, the one most familiar to any of you, let us see how it is affected by each of these classes or grades of pollution.

This stream, flowing through inhabited territory, must have characteristics which it did not possess when it coursed through a primeval country. If the country is thickly populated, it will very likely be polluted by natural drainage to such an extent that some of these values which I have enumerated will be damaged or destroyed. This is especially true in small streams. Nevertheless, if you are a riparian owner upon that stream, and are damaged by any such natural drainage, you are not entitled to any consequential damages. It is like a governmental act, the consequences of which must be borne by all to whom it applies; or a state of war, the devastation of which is visited upon you without recourse. The damage caused by such pollution must be regarded as the price which society must pay for its social and economic development. Here we must begin our computations of the effects of pollution, not with the river in its pristine purity. Some agitators forget this. They overlook the fact that some degree of contamination is irremediable, and, in striving to restore the primeval condition of a stream, they throw discredit upon themselves and upon their cause. This important matter must be taken into consideration in connection with the next two classes of pollution, for, if it is ascertained that any city or any industrial plant pours into a stream a substance which is, or which will become no more serious than that which arises from the natural drainage, that city or industry can not be regarded as in any degree damaging to lower riparian owners.

Pollution by city sewage has undoubtedly more direct sanitary interest than that by industrial wastes, for it contains usually the germs of a certain water-borne disease. It is a substance which intimately mingles with the water of the stream, and in varying periods of time, depending upon numerous natural phenomena and conditions, goes into solution, and is finally resolved into the inorganic constituents from which it is made up.

It will not be necessary for me to discuss before this audience the effects of sewage pollution. It is a subject which has been extensively studied, and the developments have been so satisfactory that the interest therein has well-nigh lost its novelty. It is not possible to purify the sewage of a city so that it will be constantly safe for domestic supply. No well-considered reform

movement will attempt to effect such a result, and, indeed, such a result is not necessary. We need only to be certain that the effluent from our sewers be purified to a point that it will not serve to increase the organic ingredients in the water, which, as just explained, must necessarily be brought there by the natural drainage from occupied land.

This matter of sewage purification is a simple one. It can be readily understood by the untrained mind. It should be stripped of its mysticism, relieved of its delightfully indefinite vocabulary, and placed before the "city fathers" with the clearness and simplicity of a junketing trip. Positively, I have heard some propositions for sewage purification, which were essentially simple, presented in a style that would have done credit to Hans Andersen.

If we are ever successful in securing the general acceptance of sewage purification works by cities in this country, it will be only after we have convinced the public that our notions are not chimerical.

In taking up the subject of industrial wastes we encounter the problem of the future; the most interesting, most poignant in the realm of water pollution. This may be due in part to the fact that in every organic waste there are ingredients which are generally fit for utilization when recovered. Indeed, there is excellent ground for the belief that there should be no such thing as industrial wastes, and the time is coming when the existence of such will be considered an evidence of poor business management. In many cases the wastes of a few years ago are now utilized at a profit greater than that obtained from the original manufactured product.

The efforts toward the utilization of the valuable ingredients in city sewage have not been productive in America, although, in Europe, there are several successful plants. It is believed that the great dilution occasioned by American extravagance in water consumption is responsible for this lack of conspicuous success in the United States. We know, of course, that the material is there, but its recovery is a problem analagous to the recovery of gold from sea water. In dealing with the purification of industrial wastes, however, we are brought face to face with the great possi-

bilities of utilization. This is both interesting and fortunate; on the one hand, a fertile field of investigation is presented, while on the other, the possibility of profitable recovery will enlist the assistance of manufacturers in securing the purification of streams.

In dealing with the industrial pollution of streams we can do our most effective work along this very line of utilization. If we walk up to a manufacturing establishment and demand certain wastes be summarily removed from a stream, the response which we receive will not be cordial, even though we have all the laws of the land at our backs. Here in Indiana you have been striving vainly for years to secure effective legislation on the subject. I do not understand the value of special legislation; it is necessary for public safety that we provide specific laws to meet emergencies, but I am of the opinion that consideration, tact and good management will, in the end, be more efficacious than badly-administered prohibitory laws. Their summary application leads generally to strife and civil suit; corporation lawyers can do wonderful things if there be so much as a pinhole in your armour, and there is always an uncertainty arising from the construction which courts put upon special legislation. If, however, we approach a corporation with suggestions concerning purification and utilization, we secure generally their aid and co-operation.

In advancing such a doctrine I realize that I am at variance with many wise men. The procedure advocated by them is practically as follows. Secure the passage of prohibitory laws, and then demand of offenders that they mend their ways. It is not the duty of the authorities to prescribe methods by which they shall bring about their improved conditions, but the work rests solely upon the shoulders of the offenders. "Why," they say, "should a corporation, already overrich, profit by suggestions and experiments made at public expense in order to secure immunity from the very overt acts which that corporation is committing?" That argument would be unassailable if the corporation were the only one to profit. But there is a large community of interests which suffers from those overt acts, and those interests should speedily be protected. If an incendiary starts a conflagration in your city, the fire department is called out to protect the surrounding interests, at public expense. You don't catch the offender and

order him to think out a method of extinguishing the fire. The parallel between these two cases can not be extended indefinitely, but the governing principles are identical.

Again, there is the objection that it is unwise for a public authority to undertake the responsibility of prescribing means which may be unsuccessful after installation. There is much justice in this contention, but it may be answered in this manner: If you set yourself up in the business of stream purification, if you venture to administer laws framed for this purpose, you carry a certain amount of dignity which arises from the assumption that you are an authority on those matters, as, indeed, you should be. Now, if a person, or association of persons, upon whom you have made demands, comes back at you with the statement that he or it will do anything you will prescribe, the matter is squarely up to you; not legally, but logically up to you.

According to the ideas held by many wise men, the only thing which you can do is to decline the responsibility; to use a homely, but highly expressive phrase, you must "crawfish," and the minute you crawfish you lose your grip. You have no logical right, as an authority, to assign to any man a problem or a duty that you are afraid to take up yourself. Therefore, I contend that it is expedient to do a thing which, from an initial view-point, will benefit an offender. I believe in the eternal wisdom of expediency, so long as we remain honorable in our practice of it.

Finally, I wish to make a few observations concerning proceedings which should be taken against corporations, public or private, which unlawfully pollute natural water courses. I have no apologies to make for any of these offenders, and do not seek to justify in the slightest degree any act which unnecessarily damages natural resources. At the same time I would recognize the rights of all parties in any contest.

The riparian rights of a corporation which furnishes a market for raw products, employs large numbers of men, and produces a necessary or useful commodity, are as good as those of a lower riparian owner who farms his land or leaves it unproductive. The converse is equally as true.

Streams which run through a country are the natural drainage outlets of that country, and liquids must run down hill into them.

It was held, in the beginning of this address, that streams running through inhabited lands must be polluted to a degree varying directly with the population. Therefore, any person who adds pollution to a stream, which does not increase the organic constituents of the water thereof to a degree higher than that already established at centers of population, should not be held accountable. The degree of pollution established by natural causes is inevitable, and he who remains within those limits is immune.

I have found, from general observation, that there is a demand among the anti-pollution agitators that the effluents from sewers and industrial plants be pure and undefiled. This is unreasonable; you can not expect any corporation to do more for you than nature does, and it is only by making reasonable requirements that we can hope for success.

In this paper I have dealt at considerable length upon the limitations which should obtain in all requirements that are made for the purpose of stopping stream pollution. I do not, however, wish to be understood as advocating any compromise. The damage to our streams must, and eventually will, be recompensed, but in bringing this about it is better, wherever possible, to assist an industry rather than to shut it down. No great and lasting reforms have ever been hewn out with a sharp ax, and this certainly is the guiding principle which controls the operations of the national government in the work of improving water resources.

EFFECT OF SEWAGE ON INDIANA STREAMS AND HOW TO REMEDY IT.

BY CHARLES CARROL BROWN, C. E.

This is a large subject and one which I can only hope to consider in a few of its bearings in an hour. I will try to make selections of topics and of methods of treating them which will be of interest in the hour that is assigned to me and hope that any failures to be specific enough or to touch upon subjects which any of you wish to have discussed will lead you to ask questions as I go along. That will be better than to wait until I am through.

I will begin with the simplest cases and the solution of the difficulties in taking care of them and run on as long as time and your patience will permit. There is no danger of running out of material, though my memory may leave out some details in which you might be interested. If so, a question will set me right. As a consulting engineer for the State Board of Health of New York for a number of years many sanitary questions were referred to me under the laws defining the duties of that Board. One of these duties is to examine water supplies on request of interested parties, whether owners of works or users of the water supplied, and to establish codes of regulations for preserving the purity of the water. Another is to examine the plans for sewerage and drainage of all towns up to a certain size, and some special cities, and determine their adaptability to the conditions and especially their conformity to sanitary practice. Naturally I will refer for examples to these inspections, but I have some knowledge of special Indiana conditions which will enable me to apply with some satisfaction to you, I hope, the conclusions drawn from the conditions in New York to the solution of problems arising in Indiana.

The simplest case which arises is that of the water supply drawn from a small area drained by a small stream which flows into a lake or into a reservoir formed by constructing a dam across the stream. There are many such water supplies in New York and

some in Indiana. The principal sources of pollution to such water supplies are the privies, pigpens and barnyards of the farmers whose lands are drained by the stream and by the dry water courses tributary thereto in which water only runs when there is a good rain or the snow is going off in the spring or the January thaw. You may think that this does not amount to much, but it is from just such watersheds as this that we have the reports of the most serious pollution of water supplies. In perhaps twenty cases under my observation there might be no danger under the usual conditions, but a single case of typhoid fever in one of these houses, or of animal disease in one of the barns, might inoculate the water supply of the whole town or city. A privy is often located over one of these small streams or dry runs because the water when it does rain carries off the deposits and saves the farmer the trouble. These streams run to small reservoirs in most cases and the fecal matter is liable to find its way directly into the water mains before it is even disintegrated; in fact, in many cases the dam only serves to turn the stream into the pipes so that there is no chance for the solids to settle to the bottom of the reservoir or for the fish to eat them up. If the privy is a little off the water course the case may be even worse, for then there is an accumulation which is washed all at once into the reservoir when the rain comes and there is still more pollution for a little while. The classic Plymouth epidemic of typhoid had such a source. The case at Ithaca was of the same sort. Here the water company had employed a number of Italians to clean a reservoir or to strip its bottom and sides, and they had camped on the ground on which they worked. After their work was all done and they had moved away leaving their accumulations of fecal matter, which included the discharges from some of them who had been ill with typhoid fever, there came a rain which washed all this matter into the reservoir, from which it found its way quickly into the distributing pipes of the water supply of the city. As a consequence there was a very serious outbreak of the disease in the city and among such of the students in Cornell University as had been accustomed to use the city water. On investigation it was found that the water supply of the college was of a similar nature but was from a stream which had not been subject to

the infection on the other watershed. So in this particular instance there was no typhoid among those who used the college water supply exclusively. A few cases of fever on that watershed, however, would have given rise to the same sort of epidemic among the people using it. The city of Bloomington, in Indiana, has exactly the sort of water supply here described, and it is subject to just this sort of pollution. An inspection of its watershed showed several houses and barns whose drainage was directly into the small stream which feeds the city's reservoir. None of the privies are actually over water which is flowing, but some of them are so situated that their deposits are very likely to reach the reservoir in their original state. It only needs the combination of a well developed case of typhoid fever in one of these places and the usual careless disposal of the dejecta from the patient to give rise to a similar epidemic in that city. It would probably be necessary for a rain storm to come at the right time to wash the filth into the reservoir, when it was partially emptied, for the filth to reach the distribution system, but these conditions go together and are likely to occur at any time with the Bloomington supply, so that really the only essential to a typhoid fever epidemic in Bloomington is the case of fever on the watershed. The rain will come and the reservoir will at that time be less than full, with almost absolute certainty, and the epidemic will then be started. The details of the Butler, Pa., epidemic are not at hand, but they may easily be due to a similar cause.

The next class of conditions to which attention will be called is that to be found on the watershed of the Croton River, which is the water supply of the city of New York. This is simply a collection of a large number of special cases similar to those above described, and their combination into a system. Most of them have larger areas from which to draw water than has Bloomington, but there is a larger population in proportion to the area and a few of the collections of houses into small villages have partial systems of sewers which concentrate the pollution, so that the cases only differ in degree, not in kind. There is, however, one essential difference which I will try to explain. The Croton watershed covers about 360 square miles and is well drained by a number of streams, which have smaller tributaries, and these many dry water

courses down which concentrated discharges of polluting matter can be brought by rain or melting snow. Many of these streams have available sites for reservoirs. These reservoirs are not in direct connection with the aqueduct carrying the water to the city, with the exception of the lowest and largest. It is evident that pollution in small quantities entering the small streams has a long and full chance to be entirely eliminated by the fish, the vegetable life, the aeration, the sedimentation in the always quiet reservoirs before the water carrying it reaches the city distribution system. Even that reaching the lowest reservoir is quite sure to be largely eliminated before it can reach the aqueduct, owing to the fact that this lowest reservoir is really a lake a dozen miles in length and over a hundred feet in depth. In short, the difference in the cases may be stated thus: If a water supply were taken from any one of the smaller dams it would be liable to the danger from pollution which we have described as imminent at Bloomington, but the water in all these smaller reservoirs is merely stored there pending the time when it will be needed in the city, when it is drawn off into the stream below, and flows therein to the great reservoir below, where it has a further passage of a dozen miles or so through a slow flowing lake, so that all Nature's kind provisions for purification have ample time to act and thus the danger of infection from the city's water supply is very materially reduced, and is by some considered almost eliminated. The city of New York does not think so, however, and has spent hundreds of thousands of dollars to remove the sources of pollution shown on the map, purchasing land, installing sewage purification plants and moving buildings, in addition to enforcing the regulations for preserving the purity of the water, which will be referred to later.

The question of what can be done to protect such water supplies from such pollution may be discussed at this point before we pass to another class of cases. A statement of what has been done will throw some light on this. The first practical step in protecting water from pollution in New York was taken in the interest of Rochester. This city draws its water supply from Hemlock Lake, which is one of the numerous lakes of central New York. The shores of the lake are a very popular summer resort for Rochester people and there are many summer cottages, boarding houses and

hotels on the shores of the lake, on the narrow strip between the water and the bluffs which border the lake. These places were discharging their filth into the lake and seriously injuring the appearance of the water as well as polluting it to an objectionable extent.

By the way I may mention an inspection of an outbreak of typhoid fever on a small scale in a small village on the stream feeding the lake from the south and farthest from the waterworks intake. The inspection indicated some cases of typhoid fever here the dejecta from the patients not being very satisfactorily taken care of. The polluted water flowed some distance down the swiftly flowing though small stream, then for a mile or two along a very sluggish course in the inlet to the lake, and then in the lake itself for its twenty miles or so of length. The fever above gave rise to no fever in the city, and the chance for it was considered very remote, but the consequences of too lax a method of procedure led to thorough measures to completely disinfect everything that could by any possibility reach the water.

The city of Rochester procured an act of the legislature authorizing the State Board of Health to formulate rules for the government of any watershed from which any water supply in the State is drawn, and providing for the enforcement of these rules. It then procured the rules by making the proper application to the Board and securing the proper approval by the local court, in accordance with the provisions of the law, and installed a system of dry closets for the various establishments along the lake shores, and employed a boat to go about and empty these closets from time to time during the season, the expense being borne by the property owners and the city in suitable proportions. This kept the water clean and greatly improved the shores of the lake for the benefit of the summer residents as well as prevented the pollution of the water supply of Rochester. This system, with such modifications as time has brought about, is still in operation.

The inspection of the watershed of the Croton River was undertaken because the city and State health authorities desired to preserve the former purity of the city's water supply. As a result of the inspection a system of rules was formulated, and they were put in force under the law. When the enforcement began it was found

that the laying of the burden of the rules on the property owners on the watershed was quite a serious task. It was possible to do much under the customs and the state of public opinion in that State on sanitary matters, but the city has been obliged to purchase much land and to move many buildings at its own expense as well as to pay a considerable part of the expense of installing sewage disposal systems for the villages and summer resorts on the watershed. Systems of rules taken from these, so far as they applied, have been put in force for many water supplies in the State, both municipal and under private ownership, and are usually comparatively easy of enforcement. Sometimes the water supply authorities are obliged to pay the expense of the changes in buildings made necessary to carry out the regulations, but after they are made they very generally have the support of the civil authorities in enforcing continuous observance of the rules laid down.

The methods of procedure in Massachusetts need not be discussed here for they are not applicable under the conditions in this State.

While the matter which we have been considering has the same origin as sewage, it is not usually called by that name. It is, I think, properly considered under the heading of this paper and is in some States the most important class of polluting matter of water supplies. In this State it is perhaps ranked by sewage proper, which I will define by giving its origin. When a town gets so large that cesspools and privies, stables and street drainage, and other city wastes can not be disposed of without nuisance or excessive cost, the public water supply has doubtless been installed. This water supply increases the difficulty of disposing of the refuse from the house because it dilutes it and both increases the quantity and the difficulty of removal, and if one wants the convenience of water-closets he must have some way of getting rid of the discharge from them. The natural consequence in these modern days is a public system of sewerage, a system of pipes and brick sewers, if necessary, to carry away to a convenient outlet the discharges from the houses, which, with the water supply in full operation, have enough water in them to carry all the solid matters. Since water runs down hill and will not run up, the outlet

for the sewers must be at the lowest point in town, and that is certainly a water course of some sort.

It is evident from the character of the sewage, which is the same, except the dilution, which we find in the old cesspools, that any accumulation of it will soon become very offensive. I found one time the discharge from a summer hotel in the mountains which was located part way down a steep bluff where there was no stream of water of any sort. The solid matters were deposited on the rocks and the finer matters clung to the face of the cliff and furnished a bed for the growth of plants which flourished on such food, which was a standing advertisement of the unsanitary nature of such a method of sewage disposal. The situation grew rapidly worse as time went on until some method of purification was adopted. Although the point of discharge was at a considerable distance from the hotel, it sent its odors up to it and they finally became unbearable. I have known of towns which discharged their sewage into water courses which were dry a portion of the year, such as Champaign, Ill., but some method of purification was necessary immediately to prevent the inevitable nuisance. Such places have some advantage over the hotel mentioned because there is water in the channel at least part of the year and every hard rain moves the deposits some distance down stream. The residents of the neighborhood have a just cause of complaint and so do the farmers who try to use the stream below for their purposes.

More towns discharge their sewage into streams which are too small and the conditions here are just as serious, though the time when they become so is longer delayed. There seems to be necessary a certain amount of dilution of sewage in order not to produce a nuisance. Any amount of sewage more than this percentage of dilution will permit causes the stream to deteriorate at a rate proportional to the excess of sewage, and so long as the amount of dilution is not increased the amount of nuisance increases. For example, the city of Middletown, N. Y., discharged its sewage into Monhagen Brook. Middletown has a population of perhaps 20,000, and at the time of the inspection, a year or so after the sewers were put in use, less than 10,000 were connected and using the sewers. The brook is used farther up as one of the sources of the city's

water supply and before such use was large enough to run a mill for a good share of the year. Its flow at low water was probably about equal to the flow of sewage. One of the mill ponds was still in existence a short distance below the sewer outlet. Notwithstanding a slight chance for sedimentation in the waters of this pond, the ordinary flow of the stream was not sufficient dilution of the sewage and we were called in on account of the suit of one of the farmers for damages from the bad odors of the pond and the creek below. The complaint was well founded, and we found large evidence of the continuing and increasing amount of the pollution of the stream for its whole length to the river below, some five or six miles. Undoubtedly, were it not for spring and fall rains and an occasional flood due to a rainy period, the stream would have been a continuing nuisance and would soon have polluted the air of the entire countryside as it did in dry seasons that of the immediately adjoining property. The water in the stream was absolutely useless for any purpose whatever, and certainly below the mill pond would not support any of the ordinary life to be found usually in streams. The city of Worcester, Mass., has had a similar case, but in that case the pollution was still greater in proportion and showed throughout the year and at times for many miles down the stream. In this case not only the farmers were injured, but also the mill owners who wished to use the water for boiler purposes, for wash water and other manufacturing uses. Worcester was therefore soon required to put in some form of sewage purification and has spent hundreds of thousands of dollars in experiments with finally some show of success.

There are many cases of this sort. There are doubtless many such cases within your own knowledge where the system of sewerage is very incomplete and short, private drains and street gullies discharge into a small stream running through the town and produce a nuisance which in long continued dry spells demands attention and sometimes gets it if the health officers do their duty. I have had more calls for advice on this condition than any other one, and the only remedy ordinarily available is a sewer or a system of sewers which will keep the objectionable discharges out of the stream or will make it into a sewer with fall enough and concentration of flow enough to take the organic matters away before they have

time to decompose. The ordinary small creek is absolutely unable to dilute the sewage of any town large enough to have a general system of sewers sufficiently to prevent the formation of a progressively increasing nuisance. The only reason any town is able to stand such a condition is that the floods in the stream are often enough to reduce the time during which the nuisance is serious to a very few days, or that the outlet is far enough away from the town and in the right direction so that the odors do not get back and the farmers are absent or complaisant and there are no other users.

The greater the amount of sewage of the same "strength" the larger the stream must be to dilute it sufficiently to prevent nuisance.

White River is not large enough to dilute the sewage of Indianapolis, and some of you have noted the fact that in long continued dry spells on its watershed the city's sewage produces a continuously increasing deterioration in its condition which is every year becoming more serious. This condition is extending farther down stream also and so affecting more people. The fish are probably numerous in the vicinity of the outlet to the sewer, for they fatten on the organic matter in fresh sewage, but it would seem to be impossible for fish to live in the stream below, where decomposition has reached such a stage that all the oxygen in solution in the water has been used up and none is left for the fish to breathe. This condition applies, fortunately, to the seasons of low water only, for when the river is in flood it is fully large enough to remove all the filth of the city without serious injury to its other uses, except as a source of water supply. Were it not for these floods, again, as in the case of the village stream, the progressive deterioration of the river at low water stages would have long ago reached a stage which would be unbearable.

While we are on this matter of nuisances from sewage I would like to report some cases on the other side to show that the question is not a simple one and that each question must be settled on its own merits, and a right solution can be approximated only by some one who has had much experience in observing conditions and the relations of the causes and effects in many kinds of conditions. As an example I will take the Mohawk River, which is a stream

carrying at low water perhaps 200 cubic feet of water a second, about the size of the east fork of White River in the vicinity of Columbus and Seymour, for the stretch which we will consider. The city of Amsterdam has about 20,000 population and is fairly well sewered. Probably the dilution was about as one part of sewage to 300 parts of river water. Aside from a trifle of floating matter there was seldom any visible indication of the pollution, but careful examinations, chemical and bacteriological, showed considerable effect of the pollution upon the water from the standpoint of a water supply. No fresh water is added in the twenty miles of flow or so to Schenectady, where the sewage from another 20,000 people entered. This addition had no effect upon the appearance of the water more than half a mile below the outlet of the sewer, and it was found on careful examination that the sewage had settled in the quiet water of the deep pond behind a dam, into which the sewage was discharged. So far as physical conditions were concerned, therefore, this dilution at the minimum flow of water in the river of 300 to 1 is ample to prevent any nuisance. The question of effect upon the water as a source of water supply will be discussed later. At Lead City, S. D., the sewage is to be discharged into a small stream which in turn discharges into Deadwood Creek, which flows through the city of Deadwood, whose water supply is drawn from a well near the bank of the stream. Before the sewage was discharged into the stream I was requested to inspect and report its probable effect. The dilution in this case would probably not be more than 5 to 1 at time of minimum flow. There is a very peculiar condition, however, which makes it practically certain that the sewage would have no effect upon the physical senses of the inhabitants of Deadwood, and upon its water supply. The great stamp mills at Lead City discharge into the stream many tons a day of very finely divided rock from which most of the gold has been extracted. There is much more of this than the water can carry and in consequence the stream is a series of small sand dams which are being constantly pushed down stream. Everything in it is therefore turned over and over and ground slowly to the utmost subdivision. In addition small wing dams are put up at intervals by men who wash this sand over for the small amount of gold it still contains. Five or six miles of this

kind of treatment, with the great delay which results in flowing this distance, is believed to be sufficient to purify the water completely, so far as the sewage is concerned. It is sometimes stated that a dilution expressed as say, 150 cubic feet a minute of flow in the stream for 1,000 people is sufficient to obviate any chance of nuisance. This is certainly on the safe side. I may have said enough to show that it is a matter which can not be reduced to rule, but is best determined for each individual case by some one who has had much experience in observing many variations in conditions. The Valparaiso case, of which much has been said in this State, was apparently decided upon a wrong basis, but it may very well have been that the result of the decision in this particular case was just.

We come now to a class of cases which is most important of all. It may seem less important than the others because the pollution is less obvious to the senses and the effects of a wrong decision are often not directly traceable and are always intangible to the ordinary councilman, who can only take statements about them on faith from the scientific men in whom he has confidence. Any pollution which does not produce an actual nuisance is likely to be considered innocuous. This is the pollution of water supplies by sewage proper. There are thirty-five or forty water supplies in this State which are taken wholly or in part from rivers or lakes. All these streams are subject to more or less pollution which is wholly beyond the control of those who are most interested in its amount and character. Massachusetts, New York, New Jersey and Ohio are far ahead of Indiana in this respect. In each of these States there are means of controlling, at least in part, the sanitary conditions of sewerage systems and water supplies. Here, too, there is room for the exercise of educated judgment in making decisions. The conditions vary all the way from pollution which is only short of nuisance, as in the case of the Schuylkill and the Passaic before it was abandoned as a water supply, to a single house on a small watershed. As already stated, the single house on the small watershed may be more dangerous to the water supply than a thousand on such a watershed as the Croton or a hundred thousand on the Ohio watershed. To return to the Mohawk River case. The river flows from Amsterdam to Schenec-

The East Fork of White River in Indiana has a low-water flow not far from 200 cubic feet a second. The city of Columbus discharges its sewage, which comes from a small part of the city, into a little sort of bayou at low water behind an island, where the solid matters settle out in large part, producing something of a nuisance. The pollution to the river itself is not visible below the island, and it seems probable that its effects have as completely disappeared by the time Seymour's water supply is reached as they do at Schenectady. The investigations at Cincinnati, Louisville, St. Louis and New Orleans indicate that the conditions of the Ohio and Mississippi rivers depend upon the pollution in the immediate neighborhoods. Louisville seems to have better water than Cincinnati, and New Orleans has the best of all. Anderson and Indianapolis have concluded, presumably after careful expert examination of the question, that White River water filtered is the best source for their water supplies. Columbus and Seymour take their supplies from the East Fork without filtering. There are many similar situations to both, and the latter class are at the mercy of their superiors on the course of the rivers. Our cities and towns in this State have heretofore paid too little attention to the sanitary features of their water supplies, and many of them find the pollution of them increasing without having any control over them. There is often the question whether a stream shall be used as a drain or as a water supply. Probably none of us will agree with the Valparaiso decision that the natural use of a water course is for any sort of drainage that any one is disposed to turn into it; but I have no doubt that we will all recognize the justice of the proposition that the rule of the greatest good to the greatest number should prevail in most cases, and consequently some streams be reserved for water supplies, while others must be abandoned to use as drains. Unfortunately this State has no competent authority to determine these questions and enforce its decisions, i. e., it has no authority which has power or to which even the matter of study of cases and report thereon can be referred.

This brings me to the last division of the subject which can be touched upon today. What can be done to take care of the pollution of our streams? So far as technical questions are concerned, this is a question for the engineer with the aid and advice of the sanitarian, and is solved with comparative ease and safety in any

particular case if the authorities are wise enough to call in competent advisers. Chemical precipitation, septic tanks, irrigation, filtration of various sorts and combinations of two or more are in use with greater or less degrees of success, depending upon their applicability to the circumstances in each particular case, and the proper one can be chosen in advance for any other case if some one with sufficient experience is chosen to make the decision and he does not have too strong leanings toward any particular method. Municipal officials are nearly all of them of the same sort, however, selected without reference to their business and educational qualifications and too much taken up with other matters to pay as much attention to the city's business as they would to their own. The States which have tried the method of delegating to a competent State authority, usually the State Board of Health, the power to inspect and approve or reject plans for sewerage and sewage disposal, and water supplies, including disposal of factory refuse and all water supplies furnished any one, have found it most satisfactory. It eliminates carelessness in the selection of an engineer and vastly improves the quality of the plans offered. Then, too, it places the sanitary matters of the State upon a uniform basis, and enables the solution of problems which affect two or more corporations with the least possible friction, and trouble, and loss of time and money. It seems to me, from my actual experience with this kind of a law in New York and my knowledge of the working of similar laws in the other States mentioned, that the best approach to an answer to the question what can we do is in the delegation of such authority to, say, the State Board of Health. Even if it has only the power of approval or disapproval, and of securing through the courts the carrying out of its decisions, and the authority to give advice on request, it will have all the power which is needed to clean up many of the water supplies of the State, to prevent the further pollution of most of them and the abandonment of such as can not be fully improved.

THE PROBLEM OF PREVENTING TUBERCULOSIS.

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The inestimable economic and social importance of the tuberculous problems need be my only apology for a paper upon a subject so much written about at the present time. When we consider that of the people at present living in our country some ten millions must inevitably die directly or indirectly from tuberculosis, and that the majority of them must die at an age at which their usefulness and productiveness are at the acme, that there is scarcely a family in our country that is entirely free of the disease, that there is no walk in life, no occupation, no altitude, latitude or climatic condition, no age or environment, no race, or sex to which it is unknown, we must admit its prevention to be the greatest of all problems, and one upon which too large an amount of thought, investigation, legislation, education or expenditure can not be made.

Tuberculosis is a disease of man and the lower animals. It spreads from man to man, from animal to animal, and in all probability from man to animal, and from animal to man. It is a typical infectious disease, the cause of which is known, the dissemination of which is fairly well understood, and the prevention of which is possible. Indeed, accepting the dictum of Pasteur that "it is in the power of man to cause infectious diseases to disappear from the face of the earth," it is a disgrace that tuberculosis exists to the extent it does at present. Unfortunately our familiarity with it has led us to treat it with indifference. Furthermore, its extinction must be attended with vast expenditures of money, the sacrifice of many valuable animals, the inconvenience of many estimable people, and the arousing of a certain amount of public prejudice, which in the beginning of any movement always impedes progress unless the greatest diplomacy is employed in the avoidance of sensationalism, and in the prevention of relapses through carelessness, such as must result from disap-

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quent and dangerous source of infection to those associated with phthisical patients than the bacilli dried and scattered in the dust. The importance of this knowledge will be again considered when we come to measures for preventing the spread of the disease.

It must also be remembered that the tubercle bacilli can be carried about by insects, especially flies and roaches, who feed one minute upon sputum or other infectious material, and the next crawl over the food in some adjoining room or house. Exclusion of flies or vermin should constitute an important part of the anti-tuberculosis methods.

In considering the lower animals as sources of infection, we find cattle the most frequent and most important. And here, again, the finely pulverized material discharged from the respiratory passages during coughing may be one of the most frequent means by which the disease spreads from animal to animal, and sometimes from animal to man. But as the number of human beings who come into contact with the lower animals is comparatively small, it seems likely that other means of distribution are more important. Among these the first place must be given to the food products. Thus milk, which constitutes one of the important articles of diet in this country, and is used extensively by both infants and adults, is found when derived from tuberculous cattle to contain considerable numbers of tubercle bacilli, the exact number probably depending upon the extent of blood infection of the animals from which it is taken. Bacilli contained in the milk may also be contained in its derivatives, such as cream, butter, cheese and ice cream. Even the flesh of the animals, especially when used in the raw state, or comparatively raw state, as in the manufacture of bologna, and the fat which is made into oleomargarine may contain the bacilli and so be infectious.

When we come to consider the avenues through which the infectious agents enter the body, we find that in rare cases tubercle bacilli pass through the placenta and the disease is directly transmitted from the mother to the unborn offspring. In the few cases of tuberculosis of the reproductive organs, direct transmission from individual to individual may also take place, but both these forms of transmission are so rare that they deserve no particular

attention when it comes to the formulation of practical measures for the prevention of the disease, and but three avenues remain for careful consideration: (1) the skin, into which tubercle bacilli may be directly implanted by careless contact with infectious material, a rather rare form of transmission; (2) the respiratory tract, into which the infectious material may be inhaled; (3) and the digestive tract, into which they may be swallowed.

It is impossible to enter into any discussion of the pathogeny of tuberculosis, but this much may be said in passing: the first manifestations of the disease do not necessarily make their appearance in that part of the body into which they may be first introduced. Bacilli entering the mouth may find their way through the tonsils to the cervical, or even to the bronchial lymphatic nodes without causing primary lesions of the tonsils; or pass on as far as the intestines, to be absorbed by the lacteals, carried by the thoracic duct to the great veins, to the heart, and then to the lungs, where the first manifestations occur. Bacilli in the atmosphere may find their way directly into the lungs with the inspired air, or may fall upon the moist surfaces of the pharynx, and be swallowed. The greatest care must, therefore, be exerted in all cases in endeavoring to determine the point of entrance of the micro-organisms, and, indeed, it is doubtful whether it can be determined in any case. Fortunately these obscure and controversial matters are of very little importance in the formulation of practical measures for the suppression of the disease. What we have to remember is that the micro-organism against which we are to wage our contest may be in the air, or in the food; may be inhaled, or may be swallowed.

The preventive measures may be considered under two headings: first, the protection of the well; second, the care of the ill.

I. PROTECTION OF THE WELL.

1. *Educative Measures.*—The education of the masses in regard to the source and avoidance of infection is of the utmost importance in regard to the future of the problem. To my mind there is scarcely any subject that is more important to impress upon school children than that tuberculosis is a germ disease ac-

quired by such contacts with infectious material as have already been described. In many States in our Union we now give our school children a course of instruction in physiology and hygiene, that is very superficial and tainted with faddism in its excessive reference to the influence of alcohol upon the system. How much better it would be if these prejudices could be set aside and the merits and demerits of alcohol given only its legitimate place, so that there might be room for an equally legitimate amount of teaching concerning the cause, nature and avoidance of infectious diseases, and particularly the most common, tuberculosis. But the mature population must also be educated concerning the tuberculosis question. By distributing pamphlets, by well-organized popular courses of lectures, by thoughtfully prepared, frequently appearing newspaper articles, by tactful advice on the part of the family physician, every one should be brought to realize the dangers that lurk in promiscuous kissing, in the careless interchange of domestic articles, such as handkerchiefs, towels, washrags, and in cases in which there are tuberculous individuals in the household, of cups and glasses, knives, forks and spoons, and such other articles as come into intimate contact with the patient. The public must be also instructed as to the dangers that may result from promiscuous spitting. This has been carried to an unfortunate extreme in many places, and legislative enactments with excessive penalties may result in the defeat of the good that might be achieved. It is also of the utmost importance to secure universal co-operation without antagonism when possible. But all these measures are directed toward the future eradication of the disease, and for its immediate suppression more drastic measures must be put in operation.

2. Legislative Measures; Dwellings.—It is essential in the state of civilization in which we find ourselves, that precise legislation shall be enacted regarding the construction of tenement houses for the poor, in order that there shall be enough light and air; that the number of individuals per cubic contents of building occupied shall not be excessive, and a suitable provision made for the thorough disinfection of such premises when infectious diseases are known to have existed. Though tuberculosis is not a disease of the poor, it is much more largely a disease of the poor

than of the rich, and though certain measures of this kind may be necessary for all classes, the poor must be especially provided for as unable to do for themselves what others might willingly do.

Workshops.—Legislation is also urgently needed in regard to workshops. I think I realize the difficulties that lie in the way of this, yet what a blot upon our civilization it is that so terrible a thing as a sweatshop, in which workmen are huddled together for an excessive number of hours, can exist. The law should prescribe how many people may work in a definite amount of cubic space, and infringements of the law should meet with severe punishment. Inspectors should examine and report the conditions in every working place.

Then there are certain businesses which may predispose to the spread of infectious diseases, especially tuberculosis; as for example, badly regulated laundries, second-hand shops, old clothing stores, rag and waste shops, and many others may suggest themselves. What evils may not infest a bale of old rags!

Vehicles.—Then there should be precise legislation regarding the public carriers, and their measures for protecting their patrons. For example, livery carriages are constantly employed to transport sick persons to hospitals; the whole world rides in trolley cars, steam trains, Pullman cars, etc., yet most of these vehicles are rarely cleaned, and almost never disinfected.

Foods.—Lastly, and perhaps most important, we come to food as a source of infection. It is in this direction in all probability, that the best work in the way of legislation has been accomplished, but even here it is legislation that counts for little. There are perhaps enough good laws, but inadequate means of enforcing them, and in many places too little disposition toward seeing that they are enforced. Let us take for example the subject of meat inspection. The United States Government has most excellent rules for the inspection of the carcasses of slaughtered animals and their rejection for tuberculosis that should be the model for all legislation on the subject. A number of the States have laws similar to those of the general government, and many municipalities have their own laws, many of which are quite as good. In the State of Pennsylvania, the city of Philadelphia has laws even more severe than those of the general government. But in most

cities these laws count for very little and often can not be carried into effect, and in large cities where there are many slaughter houses, few of the slaughtered animals are inspected, and a large amount of diseased meat is offered for sale. Thus, in the city of Philadelphia, where the meat inspection is probably better than anywhere else, there were until two years ago, about seventy-five slaughter houses, in which animals are killed at least twice a week, and there were only two meat inspectors. Think of the physical impossibility of having two inspectors examine the animals killed in seventy-five slaughter houses twice each week! At the present time there are fifty slaughter houses, thirty-nine of which are inspected by eight officials. I am told by excellent authority that twenty inspectors would still be an inadequate number, and the inspection is quite superficial. But suppose there were still more inspectors, we should not be at the end of our difficulties because of the dressed meat brought in from the country where it is killed upon farms where inspection is impossible. It will, however, be argued that meat is of very slight importance with regards to infection with tuberculosis, and this I grant, but what is true of meat is also true of milk, and milk and its derivatives constitute some of the most important of our foods.

Milk.—The milk of the rich comes from large dairies properly inspected where the animals are tested for tuberculosis, but the milk sold to the poor is unfortunately quite a different article. There are laws regarding dairy inspection, and all dairies may be inspected, but the dangerous milk comes from farms with two or three cows, and from milk dealers who run a common grocery store, where the milk is thin as water and rank as sewage, and comes from cattle of unknown condition and may contain anything under the sun in the way of infectious agents. In large cities, in particular, it is impossible to control this traffic with certainty, and it seems to me the only way in which pure milk can be insured for the poor and careless will be by the establishment of municipal milk depots, at which certified, and if necessary Pasteurized, milk can be sold to the poor at cost price. It should be made difficult to secure licenses for the sale of milk, and these licenses should be easily revokable in case of infringement of the law. Dairy inspection is, of course, of fundamental import-

ance, and although the compensation usually offered by the State is inadequate, all tuberculous cattle should be killed, not only because of the danger of infecting consumers of the milk, but also because of the danger of infecting the other cattle in the dairy.

II. CARE OF THE ILL.

This is quite as important a question with regard to the general good as to the individual good. Those ill with tuberculosis must be treated either at home or away from home. In the latter case they will probably be in sanitariums or hospitals, where the problems of the disease and the precautionary measures to be observed are well understood, and the patients cease to be a danger to the family or the community. Such patients pass out of the present discussion. The tuberculous patient at home is, however, a different problem, and one that merits the most careful consideration. When the circumstances of the patient are affluent and he is treated by an intelligent physician, and has himself sufficient intelligence to safeguard his family, the matter is simple. The real problem is the poor man or woman, who, in spite of tuberculosis, must work for a living or care for a family for some time after the disease begins, whose intimate social conditions can not be abruptly terminated, who sees a physician infrequently, or not at all; whose poverty, weakness, ignorance and proverbial carelessness determine that no attention shall be paid to the essential precautions against the spread of the disease. These patients are often members of large families; they live in limited space, with insufficient light and air; they are improperly fed, inadequately protected by clothing that is rarely and insufficiently washed, and come into the most intimate contact with one another.

These conditions are most discouraging, but they must be met, and must be met every day. The first thing that naturally suggests itself is that the patient must be removed because of the danger at shop and at home, but if he is removed the support of the family is gone. Or if he can no longer work and is then a source of expense to the family, he or they may refuse interference, or still worse, there may be no place for him to go. Most hospitals close their doors upon the consumptive. Yet, because this problem is a difficult one, it becomes a most important one.

The first thing that must be done to meet the difficulty will be to find out where such cases are, and for this reason compulsory registration of all cases of this disease is indispensable. Every case as soon as registered should be visited by an inspector and a report of the conditions made. If the report is favorable, no more need be done, but if the case belongs to the class under consideration, then the utmost care should be taken to defend the uninfected members of the family by advice and instruction, and to prevent the premises from becoming a pest focus. In every city there are a number of houses known to be such foci, from which disease spreads.

The administration of public charities is an extremely difficult problem, but I know of none better than that which would have for its fixed purpose the eradication of this universally prevalent disease, and alleviating the financial and domestic distress it occasions.

If you are not familiar with the work that has been done in the city of Lille, in France, I advise you to acquaint yourself with the particulars of it. It has not been attended with the success originally hoped for it, just why I do not know, but in principle it can not be wrong. It includes first, a public dispensary which indigent persons suffering from tuberculosis are invited to attend free of cost, where the patient finds the best of doctors to make his case a special study, and as an inducement for continued attendance, he is not only given medicine free, but when, after the visit of an inspector to his home, his circumstances are shown to be impecunious, he is provided at public expense with essential foods, such as milk and eggs, either at a very low cost or entirely free; he is also invited to place his soiled clothing and bedding in bags especially supplied for the purpose and collected at fixed times, which are taken to an institution, disinfected, washed and returned free of cost. There is no coercion about the system; it is apparently voluntary, but perhaps a certain amount of coercion might be advantageous.

What can be better than for the patients under consideration that they shall have done for them that which they can not and will not do for themselves? They can not keep themselves clean, they must be kept so; they can not afford to disinfect their homes,

it must be done for them; they do not know how to protect themselves and their families from danger, they must be advised on these particulars.

Another measure that can only be used in co-operation with those already suggested, is the free tuberculosis hospital. Not the expensive sanitarium, but a free hospital open to all who apply, and made so attractive that the ill will desire to go to it. It is not like an almshouse that if attractive would at once be filled with the shiftless. Malingery in tuberculosis is easily detected and only those with bacilli in the sputum need be admitted. Forcible isolation or segregation of tuberculosis patients has failed, because the patients naturally resist it. But there are innumerable cases of tuberculosis throughout the country that would gladly welcome an opportunity to enter a tuberculosis hospital, and whose admission to one would relieve their families of financial embarrassment as well as the dangers of infection, and so be a boon to all concerned.

In these remarks I may have added nothing to what you did not already know, but I hope I have increased your interest in one of the most important personal, domestic, social, municipal, economic and national problems of the day.

You are health officials. Upon you will devolve many opportunities for aiding or hindering this important work. You do not know when you or those nearest or dearest to you may be the victims of this terrible malady, so that selfish as well as philanthropic motives should combine to make you wage an unending warfare against it.

INSECTS AS FACTORS IN THE SPREAD OF DISEASE.

BY DR. JOSEPH M'FARLAND, PHILADELPHIA.

The first important resume of our information upon this subject that came under my observation was a paper in Volume VIII, of the Johns Hopkins Hospital Reports on "The Role of Insects, Arachnoids and Myriapods as Carriers in the Spread of Bacterial and Parasitic Diseases of Man and Animals, an Historical Study," by George H. Nuttall, M. D., Ph. D. After having read that paper I became interested in the subject, and finally wrote a short contribution upon "The Relation of Insects to the Spread of Disease," which was published in "Medicine" in January, 1902. Since that time our information has increased considerably, and a number of facts have been subjected to experimental investigation and correction, but the arrangement that I adopted in that paper seems sufficiently satisfactory to form the basis of the present discussion.

The importance of insects as carriers of disease becomes more and more apparent every day, and modern writings on hygiene must be regarded as very imperfect and incomplete if they do not devote a considerable space to the consideration of insect pests, their mode of multiplication, their contact with human beings, the injury that may result from such contacts, and the means by which such may be prevented. A large part of the prophylaxis of well-known diseases will in the future doubtless depend upon the simple use of mosquito wire in the windows and mosquito bars over the beds, and it is by no means out of place that I should address a body of health officers upon the importance of this very simple but neglected measure, by gathering together a sufficient amount of facts to convince you that the evils that have been mentioned are real and not imaginary.

(1) *Insects may carry about disease-producing micro-organisms that have collected upon their bodies and occasion infection directly by alighting upon wounds, and indirectly by alighting*

upon foods, etc. It is, of course, the domestic insects that will be most culpable in this particular, and in the majority of cases it is the common diseases that are so transmitted. The most important insect for consideration is the fly, but bedbugs, lice, fleas and roaches must not be neglected.

When we consider that flies lay their eggs in manure and consequently spend much of their time walking about upon it, it requires little experimental demonstration to convince one that such flies may be soiled with the manure, and may harbor upon their bodies whatever micro-organisms it contained. Fecal matter of all kinds seems to form a large part of the food of the domestic fly, but, unfortunately, this insect does not limit its activities to the neighborhood of the cesspool, but subsequently enters our houses in large numbers and partakes of our own food, which no doubt in many cases it infects with harmful as well as harmless micro-organisms attached to its body. Moreover, flies are sometimes extremely sociable, and worry us with excessive personal attentions. They also seem to find that which is attractive as well as nutritious at the edges of the eyelids, the nostrils, the mouths of sleeping infants and upon the skin, especially when abraded, of infants and adults.

There is very good reason for believing that the Egyptian ophthalmia and probably the pink-eye of our own country, and other mild and severe affections may have their origin through these means, and how many other local diseases they thus transmit is not known. But far more important is the relation that flies bear to the transmission of such constitutional, infectious diseases as typhoid fever, plague, cholera, etc. By permitting a fly to walk over a culture of bacteria and then to walk over sterile media contained in a Petri dish, it is found that the infectious material remains attached to its body for more than forty-eight hours; therefore, any fly that has visited a cesspool or a latrine or a cup of tuberculous sputum, within that length of time may scatter micro-organisms upon any article of food upon our table, or place them upon susceptible parts of our bodies.

You are, no doubt, familiar with the results of the investigations of the Commission appointed to study typhoid fever among our soldiers during the Spanish-American war, and the conclusions

they have come to regarding the importance of the fly as a chief factor. How simply might the health of our soldiers have been protected had the flies been eliminated from the latrines, the mess-rooms, and from the tents!

(2) *Insects may take disease-producing micro-organisms into their bodies with their food and subsequently deposit them in their excrement in such manner as to occasion disease.* Here again the domestic insects are the chief important factors. There is very little difference between this mode of infection and that already discussed, except that the insects instead of being soiled outside are soiled inside by the food they have consumed. Now the importance of this is considerable in regard to the suctorial flies. These flies taking blood from living animals receive the micro-organisms into their intestines where they are very slowly destroyed, and commonly pass through uninjured. In this way fleas may transport plague; that is, having bitten a person having plague bacilli in the blood, the flea may pass on to another person and without directly introducing the bacilli with his proboscis, may deposit them upon the skin in his excrement so that they may be carried in by the abrasion caused by subsequent scratching. This may also be true of anthrax and various other micro-organismal diseases, and bedbugs and lice may act in exactly the same manner.

In this connection it must also be remembered that many insects have parasites natural to their intestines. Many of the larger insects are the hosts of intestinal worms, flagellate and other protozoan parasites, and which may sometimes find entrance into human beings and act as infectious agents.

Nuttall found plague bacilli in vast numbers in the excrement of insects as long as ninety-six hours after they had bitten an infected animal; those that remained longer than this were found to be dead or devoid of virulence.

(3) *Suctorial insects may immediately transfer the essential cause of disease from individual to individual through their infected mouth parts.*

The literature contains a large number of cases in which anthrax is said to have followed the bites of flies, and as the anthrax bacillus requires no incubation period, and undergoes no cycle of

development in the body of the insect, this transfer must be immediate. It is almost universally claimed that fleas, lice, bedbugs, and other biting insects may transmit plague in the same manner, but it is by no means certain that this is the case, and Nuttall in the experiments recorded in a paper published in the *Centralbl. fur Bakteriologie*, etc., April 12, 1898, Volume XXIII, Number 14, page 630, found that when insects were allowed to prey upon infected mice and then upon healthy mice, the latter did not become infected, even when the biting insects were pressed upon so as to play the possible role of an injecting syringe.

(4) *Suctorial insects may take up infectious organisms in the blood of animals bitten, themselves becoming infected with the parasites which remaining in their bodies long enough to undergo definite transformation, are transmitted to animals subsequently bitten.*

Filaria.—The most interesting insects of this group are the mosquitoes. The idea that the mosquito may serve as a carrier of the *Filaria sanguinis hominis nocturnis* (*Filaria Bancrofti* of Cobbold), seems to have occurred almost simultaneously to Bancroft in Australia and Manson in China. In 1877 Bancroft wrote to Cobbold wondering if mosquitoes would take up hematozoa and convey them to water, and the same year Manson wrote to Cobbold about his observations on the development of the parasite in the mosquito, and sent his manuscript for publication. In this paper published in 1878, Manson found that when the embryonic form of the *Filaria sanguinis hominis* was injected by the female mosquito with the blood of infected human beings, it underwent certain developmental changes. By far the greater number of the ingested filaria die and are disintegrated, only a few cases seem to undergo metamorphosis. The outer sheath separates from the body, giving rise to a double contour of the parasitic worm, and the body begins to show transverse striations. The sheath is either digested by the gastric juices or ruptured by the filaria, which becomes free and more markedly striated. The striation then disappears and the parasite becomes granular and the movements less active. After thirty-six hours it ceases to move actively, grows shorter and broader, and the granulations become finer. By the end of the third day a tail appears to spring abruptly from the end

of the sausage-like body, and large cells may be discerned in the homogeneous protoplasm, while it presents something of a double contour. Indications of a mouth and an anus a little in advance of the tail, are seen. The parasite now becomes elongate, the mouth acquires three or four lips, and the alimentary canal is indicated by a delicate but visible line running from mouth to anus. This formidable looking animal is undoubtedly the *Filaria sanguinis hominis* equipped for independent life and ready to leave its nurse—the mosquito. The organism next leaves the stomach and intestines of the mosquito and enters the thoracic muscles, where they reside from sixteen to twenty days to complete the metamorphosis.

The mode of transmission of the organism was discovered by Dr. Low, who found that the completely metamorphosed worms find their way into the proboscis by making a road for themselves between the under surface of the hypopharynx and the upper surface of the labium, where it can be easily recognized in sections of the mosquito, lying free among the stilettes. Apparently the filaria seeks to emerge in pairs, for such must be its object for entering the proboscis in pairs. At all events, Manson found in all the sections he examined that two worms were situated close together, their heads pressed toward each other, and close to the tip of the proboscis. The parasite, it would seem, remains in this position for an indefinite time, presumably watching an opportunity to enter a warm-blooded vertebrate host when the mosquito next feeds on such. Apparently the filaria can discern between flesh and vegetable, for when the mosquitoes were fed upon banana, they could still be found cuddled up in the head, or stretched along the proboscis.

These observations also prove that the filaria is introduced into its human definitive host by a mosquito bite. The mosquito in which this transformation takes place is the wide-spread species known as *Culex pipiens*.

Malaria.—The second important infection that occurs in this way is malaria fever, for which, again, the mosquito is responsible. As in the case of the filaria, we find that not all mosquitoes can serve as definitive hosts of the parasite of malaria, but only mosquitoes of *Anopheles* and allied genera. There are all told,

about four hundred species of *Anopheles* mosquitoes in different parts of the world, but by no means all of these can act as hosts.

In his paper upon this subject, in the *British Medical Journal*, September 17, 1904, Stephens shows that there are only eleven species known to transmit malaria. Some of the members of the same genus are pretty certainly known not to transmit the disease. Thus, Stephens failed to find that *Anopheles rossii* could do so, and Hirshburg has shown that in all probability *Anopheles punctipennis* can not. The gametocytes of the malarial parasites being taken with the blood into the body of the mosquito, there undergo sexual fertilization and subsequent transformations resulting in zygocytes, which work their way through the wall of the intestines, remaining adherent to the outer surface, and continuing to enlarge. Subsequently each breaks up into a blastomeres, which ultimately give rise to an immense number of sporozoites. These minute falciform or trypanosome-like bodies being free in the body cavity of the mosquito quickly find their way to the salivary glands, enter into the epithelial cells from which they subsequently escape in the saliva at the time of its active secretion, passing down the ducts of the glands along the proboscis and into the inflicted wound. Similar transformations take place in the malarial disease of the lower animals, birds, etc.

Yellow Fever.—Another important disease that is transmitted by mosquitoes is yellow fever, the responsible insect being the *Stegomyia fasciata*. Here we have to do with an unknown parasitic organism, yet with a mode of transmission that seems to have been satisfactorily demonstrated. That is to say, the *Stegomyia fasciata* having bitten a patient suffering from yellow fever and presumably taken into its body the essential parasite of the disease, remains inactive during a period averaging about eleven days while the parasites are undergoing a metamorphosis similar to that described for the malarial parasite. At the end of this period and until its death, which may not take place for one hundred days, the infected insect seems able to impart the parasitic organism to whatever individual is bitten, and so establish the infection. So far as is known, no other mosquito than the *Stegomyia fasciata* is capable of acting as a host for the parasite.

H. Graham, in the *Journal of Tropical Medicine*, see *Journal*

of the American Medical Association, July 25, 1903, page 265, believes that dengue fever is transmitted by the bites of *Culex fatigans*; possibly also by *Stegomyia fasciata*, and believes that he has discovered the protozoan parasite whose evolution in the mosquito and patients suffering from dengue fever he has successfully outlined, but his work has thus far received no confirmation.

Trypanosome.—Among the most interesting instances of the transmission of parasites by insects are the trypanosome diseases, of which probably the first and best known is nagana, or tsetse fly disease. It has been known since the earliest days of African explorations that so soon as a certain suctorial fly, known as the tsetse fly, made its appearance in any locality and began to attack the domestic animals, they became afflicted with an acute febrile, and subsequently chronic wasting disease known as nagana. It was also found that in certain portions of equatorial Africa this fly regularly resided, but that it was subject to occasional migrations, and later these migrations were found to correspond to the movements of certain wild animals, the antelope, etc., upon which the flies evidently fed. Still later it was discovered that the blood infected by the flies contained thread-like, actively motile, flagellate parasites or trypanosomes, now known as *Trypanosome brucei*. The life history of this parasite has not yet been satisfactorily worked out, but its relation to the tsetse fly is well understood, and our knowledge of nagana, and its mode of transmission, was the starting point of investigation into the nature of many other epidemic febrile diseases of domestic animals, resulting in the discovery of the *Trypanosoma evansi*, which is the cause of surra, an epidemic disease of horses prevalent in the East Indies, and distributed by the suctorial fly known as *Stomoxys calcitrans*; a cattle plague of South Africa caused by the *Trypanosoma theileri*, the intermediate host of which has not, so far as I know, been determined; mal de Caderas, a cattle plague of the pampas of South American grazing lands, for which the intermediate host has also not been determined.

It may be in your minds that such investigations upon the diseases of the lower animals have little bearing upon human medicine, and especially upon the hygienic work which occupies most of your time, but I have mentioned the particulars of these affec-

tions in order to show you the vast importance of correlating our knowledge of human and comparative medicine, for there is prevalent in certain parts of equatorial Africa a generally fatal malady usually seen among the natives but occasionally affecting Europeans, which is known as African lethargy or sleeping sickness. But a short time ago this affection was subjected to careful etiological studies by Castellani, who found the diplococcus in the cerebro-spinal fluid, and went so far astray as to regard this as the etiological factor of the disease until some peculiar interruptions took place in his work, for while he was engaged upon it, Ford and Dutton reported the discovery of trypanosoma in the blood of certain individuals suffering from a slow febrile disease acquired in Africa. This immediately started a most ambitious study of the bloods of patients suffering from maladies in tropical countries, with special reference to the trypanosoma, and very fortunately enabled Castellani to discover the presence of such parasites in the blood of patients suffering from African lethargy. This observation completely changed his original view of the disease, and made him devote himself to a careful experimental study of these trypanosomes in apes, with the result that he was able to demonstrate with sufficient clearness the presence of trypanosomes in the blood of an overwhelming majority of patients suffering from lethargy. Second, that by the inoculation of these trypanosomes into apes he was enabled to induce typical sleeping sickness in those animals, so that the relation of the trypanosoma to sleeping sickness seemed to be clearly demonstrated. It remained, however, to be determined the intermediate host, and apply our knowledge of the effect of insects in the transmission of other trypanosoma diseases, from various observations made in the hope of solving this problem of African lethargy, it resulted that another tsetse fly differing from the *Glossina morsitans* which cause nagana, and known as *Glossina palpalis*, was found to correspond exactly in its geographical distribution with sleeping sickness, and then by a succession of experimental observations was sufficiently implicated to make quite certain that it disseminates the disease.

The well-known trypanosoma disease of rats which is prevalent everywhere and is caused by the *Trypanosoma lewisi* seems to be transmitted by fleas, and the trypanosoma disease of birds usually

called the malarial disease of birds, caused by the *Halteridium danelewskyi*, now called since the investigations of Schaudinn, the *Trypanosomes noctuae*, and the *Proteosoma Grassi* called by Schaudinn the *Trypanosoma ziemanni*, are transmitted by mosquitoes, so that we find several genera and species of flies, of mosquitoes and fleas acting as intermediate hosts of parasites of various of the lower animals and of man.

(5) *Suctorial insects taking up infectious micro-organisms with the blood of animals bitten, become infected, transmit the organism in some modified form to their offspring, by which new animals are infected.*

This mode of transmission seems to be definitely proven for one disease, viz., Texas fever, and is suspected for "tick fever" of Africa and other countries, and of "spotted fever" of the Bitter Root Valley in Montana.

In the case of Texas fever we have to do with a minute protozoan parasite known as *Pirosoma bigenium*, discovered by Smith and Kilburne, and the insect by which it is transmitted is the cattle tick, known as *Boöpholis bovis*, and probably also the similar tick, *Boöpholis astralis*. Studying the life history of the parasite in the tick, we find that when the adult tick is mature and distended with blood, it loosens its hold and drops upon the ground and then proceeds to lay a mass of eggs almost equalling in bulk its entire body. From these eggs embryo ticks hatch, each containing, though undiscoverable in its body, the infectious organisms of Texas fever, so that when these little ticks are placed upon non-immune cattle, their bites are almost immediately followed by the development of the disease.

In regard to "spotted fever," Wilson and Chowning, Journal of the American Medical Association, July 19, 1902, came to the conclusion that the disease resulted from the bites of the tick known as *Dermacentor reticularis*, by which a parasite known as the *Pirosoma hominis* is transmitted. The more recent work by Anderson, American Medical Association, September 26, 1903, confirmed the work of Wilson and Chowning. But the most recent investigation of the subject by Stiles, United States Hygienic Laboratory, Bulletin No. 20, April, 1905, seems to show that the previous observers had been mistaken, and that the existence of the

Pirosoma hominis is very doubtful, and that it is equally doubtful whether the tick and its bites have anything to do with the disease.

Although I have been able to touch but briefly upon the various infections for which insects may be held responsible, I think I have been able to show you their importance as factors in the spread of disease, and what holds true for the diseases considered, may also be true of many diseases, the nature and origin of which at the present time is obscure. How little we really know as to the actual mode of contagion in variola, morbilli and scarlatina. We commonly regard it as in the air, but that which is in the air may really be in the body of some insect, and we must never be content with our knowledge of any infectious disease until we have discovered its true cause and the means by which it is disseminated. This always makes easy the prophylaxis of disease, this prophylaxis being founded upon three chief fundamentals: First, precautions that no insects shall become infected from a diseased individual; second, that obnoxious insects shall be exterminated; and third, that precautions be taken to protect individuals in every way from obnoxious insects.

THE COMBAT AGAINST TUBERCULOSIS.

DR. CHAS. O. PROBST, COLUMBUS, O.

Let us consider for a moment the ravages committed in our country by this common enemy of mankind. According to the U. S. census report from 1900 there were 110,801 deaths, that census year, from tuberculosis in its various forms, 109,492 of these being from the ordinary form, consumption, or pulmonary tuberculosis.

In the State of Indiana for the same time there were 4,282 deaths from tuberculosis, with 4,232 of them from consumption.

Just think of what this means! During the hour I am permitted to talk to you, about 13 (that unlucky number) of our countrymen will die of tuberculosis.

It is a remarkable trait of human character that enables man to accept and support the most grievous ills, if they seem inevitable. We read of some eight or nine convicts in Sing Sing, condemned to death, who recently held a meeting to elect a mayor of their little community; and the speech of the chosen mayor was humorous in the extreme. People are apt to accept Pope's line, "Whatever is, is right," to mean that whatever is right today will be the same tomorrow, and do not seek to change conditions. Sudden calamities like the Johnstown or Galveston flood, appall us, because of their rare occurrence. The same number of people might be drowned in a year, a few every day, and this go on indefinitely without exciting public alarm, and scarcely comment.

Predestination is the attitude of public thought that we must destroy. We must thoroughly convince the people that tuberculosis exists among us because we permit it to do so. With the knowledge we now have I am fully convinced that a skilled sanitarian, with unlimited means, and power to enforce sanitary regulations, could build a city of any size and maintain a death rate from tuberculosis of not to exceed one in a thousand, instead of one in ten as it now is.

Before taking up the means of preventing tuberculosis, it will be well to briefly consider the nature and cause of the disease. This is familiar ground to most or all of you, but it is a logical manner in which to proceed. We want to know all about our enemy, his strength and position, in planning our defenses and attacks.

Koch has told us that tuberculosis is caused by a tiny parasite, a vegetable germ, that enters the body through various channels, but usually by the lungs. If it finds a good growing place, a suitable soil, as we say, it there multiplies, possibly in vast numbers. In growing it produces little tubercles or nodules, whence the name tuberculosis. These tend to soften and break down, destroying the normal tissues. This process is hastened if not dependent upon the introduction of other bacteria, the streptococci and staphylococci, which in most cases of pulmonary tuberculosis, sooner or later gain access to the lungs.

When tuberculosis of the lungs has become established the history of the individual cases will vary greatly. In the majority of cases the disease is of at least one and one-half to two years duration, and it may last for many years. It is for this reason that we have so much difficulty in controlling the disease, for during all this time the consumptive may be a source of danger to those about him. In the acute infectious diseases, like smallpox or scarlet fever, we can control the patient during the period the germs that cause the disease are active. We shut the patient up, and after he is well we destroy the germs he has left behind him. This is impracticable in a disease like tuberculosis, lasting for years, and affecting a large part of our population.

The bacilli, when the lungs alone are affected, are cast out of the body with the sputum. They are found nowhere else. It is the drying of this sputum and the scattering of infected dust to be inhaled by those in contact with consumptives, that is responsible for the great majority of cases of tuberculosis. If this sputum could be at once destroyed, or the germs in it be killed, we would practically wipe out this disease. No combination of bad sanitary surroundings can cause tuberculosis; the specific germ must be present.

What becomes of the tubercle bacilli cast out with the sputum? Doubtless most of them soon die. Your illustrious visitor, General

Sternberg, has shown that direct sunlight will destroy them in a few minutes, if the sputum is spread out in a thin layer, and in a few hours under ordinary conditions. Even diffused daylight will do so in six or seven days. On the other hand, in dark, damp, badly ventilated houses, they may live for months, possibly years.

Dr. Flick in his study of the location of cases of tuberculosis, in Philadelphia for a period of years, has shown that a preponderance of cases occurred in a comparatively small number of houses. Dr. Biggs has shown the same thing for New York City. The total number of cases in ward 4 of that city in four years was 541; of these 302 occurred in 28.2 per cent. of the infected houses, which had a record of three or more cases. It appeared, therefore, that 55.8 per cent. of all the cases in the ward for the four years occurred in 28.2 per cent. of the houses infected, or in 10.5 per cent. of the total houses.

Here then is the enemy against which our efforts must be directed; this invisible vegetable parasitic germ, which has produced so much sorrow and death, and is still destroying a full million of our fellow beings each year.

Considering the number of victims, their universal presence, the task of eradicating tuberculosis seems almost endless. Our hope lies in the fact that we can carry on both a *defensive* and *offensive* warfare. We can destroy large numbers of the enemy. We can do more by developing healthy bodies, invulnerable to his attack. Perfect health will not protect us against smallpox and some of the other infectious diseases. Fortunately for us it will protect us against tuberculosis.

Statistics show that tuberculosis is steadily decreasing in this as well as in other countries. Our census for 1890 showed, in the registration area, 12,146 deaths from tuberculosis for each 100,000 deaths from all causes, or 12.14 per cent. of all deaths. In 1900 there were 10,688 deaths from tuberculosis to each 100,000 deaths, or 10.68 per cent. of the total mortality. In 1890 there were 245.4 deaths from tuberculosis in each 100,000 of the living population, but in 1900 there were only 190.5. In New York City, where a most active campaign has been waged against this disease, the mortality has been reduced about 40 per cent. within the last twelve years.

This lowering of the death rate from tuberculosis is, I think,

largely due to improvements in the sanitary surroundings of the people. We have cleaner, better lighted and ventilated houses, cleaner cities with better drainage and water supply. Better food and better cooks. With all this we have better health, and are stronger to resist an invasion of the tubercle bacillus. There is, no doubt, greater care to prevent infection, and this has helped lower the death rate.

What has already been accomplished should spur us on to greater efforts, for it gives us positive assurance that results will be forthcoming.

But we have dealt long enough in general terms in considering this subject. As executive officers you want, I know, something specific, something tangible, something possible.

Let us divide the subject, as before indicated, into offensive and defensive measures. Offensive measures are those for the destruction or control of the bacillus tuberculosis. The defensive measures are those that tend to make the body proof against an attack by this germ. In some places they will necessarily overlap.

First and foremost is the education of the people as to the nature and cause of tuberculosis and how to prevent it. That is, in brief, we must teach them that it is a disease that may be communicated from one person to another by means of the sputum, and how to care for this sputum in order to prevent this.

This seems very simple, but to educate even the majority to a full realization of these facts is no light task.

There are numerous ways to get at this, and all of them should be employed. The State Board of Health can distribute to health authorities, school teachers, ministers of the gospel, and other classes of people, pamphlets giving this information. It can be taught in colleges and to the older children in the public schools. Lectures may be given at teachers' and farmers' institutes, before women's, workmen's and other clubs. Above all the press may be interested.

Pardon me if I speak of a plan being carried out in my own State by the Ohio Society for the Prevention of Tuberculosis. This society communicated with every newspaper in the State, nearly 500, asking whether they would publish articles of an educational character relating to tuberculosis. About two-thirds of them promised to do so. Six articles have been published so far.

These are sent about every two weeks on Friday to each newspaper in the State, marked to be released on the following Monday. There is usually a lack of news on that day, hence its selection. The plan has worked well, and I know of no way in which so large a number of readers can be reached, if the large dailies will publish such articles, as they have done in Ohio.

By some or all of these various methods the public can be taught the essential things concerning the causation and prevention of tuberculosis.

The family physician's part in this work has not been mentioned. He may occasionally need instruction. The main thing is to get him interested. This can be done to a considerable extent by bringing up this subject for discussion at the State and County Medical Society meetings. The family physician is undoubtedly the most important agent of all. He sees most of the cases of tuberculosis, and could very largely insure the proper care of the sputum if he would. There are certain phases of this part of the subject that I would briefly discuss. The physician too often hesitates to make the diagnosis of tuberculosis until the nature of the disease is quite apparent to everyone. This is often too late to prevent the infection of others, for long before this the patient may be scattering about him millions of tubercle bacilli.

There was some excuse for this when the disease was thought to be incurable, and still more when it was not considered infectious. There would seem to be no excuse now except in rarest instances. The patient has more than an even chance to be cured early in the disease, but not unless he knows its true nature. It can not be expected that he will faithfully carry out instructions as to fresh air, diet, rest, etc., and possibly give up his occupation, if told he has bronchitis, a bad cold, or put off with some evasive answer in regard to the real nature of his disease. It is therefore a great injustice to the patient not to inform him of the fact. It is also most unjust to those about him who may become infected from lack of such knowledge.

Admitting these points, and it seems to me we have destroyed any reason that may be urged by physicians against reporting their cases to the health authorities. It is the opinion of practically all workers in the field of preventive medicine that such reports ought to be required. Without any meddlesome interference the health

authorities can in many ways make use of such reports. It gives opportunity for the disinfection of rooms in which patients have lived or died. The family is hardly able to do this properly even if willing. In the case of the very poor it may be advisable for the board of health to furnish disinfectants during the continuance of the case. In some instances it may be desirable to remove the patient for the protection of others, and it is only by such reports that a knowledge of these cases could be gained. Reports of a succession of cases in different families in the same house might call for radical changes in the sanitary arrangement of the house, as well as disinfection which could be ordered by the board of health. In New York City physicians have been required to report their cases for some years. At present it is thought that fully 85 per cent. of all cases are reported to the board of health.

Along offensive lines followed by many boards of health is the prevention of spitting in the street cars, in public places and on the sidewalk. This has done much for comfort and decency if not for the prevention of tuberculosis.

A recommendation I would make in this connection to health authorities is to interest those employing large numbers of indoor laborers in preventing spitting on the floors of the work shops and factories. They should provide cuspidors for their employes and arrange for their proper care, and then forbid spitting elsewhere.

There is, no doubt, danger from tuberculosis in traveling in railway cars which ought to be greatly lessened. Especially is this true of Pullman cars. Your own State Board of Health has been foremost in agitating, and in bringing about some of the needed reforms in this direction.

The suggestion that has often been made that railway companies be compelled to furnish separate coaches for tuberculous passengers has never seemed to me feasible or just. It would be difficult if not impossible to insure their use by such persons. How is the conductor or ticket agent to know whether a passenger has consumption or not? But it seems unreasonable to require a person to be isolated during possibly a short journey, when we allow him to go into hotels, theaters and all public places as soon as he leaves the train. If we could prevent all spitting on the floors of cars, and insure the disinfection of Pullman bedding at the end of each run, we would have accomplished most all that is necessary.

Offensive work may be carried on in our public institutions. In many of our penitentiaries the death rate from tuberculosis is frightful. Penned in in dark, unventilated cells, with no disinfection of sputum of the many consumptives always present, how could it be otherwise?

In asylums for the insane and in the county poorhouses there is also opportunity for good work in the prevention of tuberculosis. I was much pleased to note at a visit a few years ago to the Kingston, Ontario, Asylum for the Insane, that there was a complete separation of the tuberculous inmates. Last summer the Columbus Hospital for Insane tried keeping a considerable number in tents. They made much improvement in every way. Our legislature has been requested by both the Columbus and Toledo Hospitals for the insane to make appropriations for permanent cottages for their tuberculous patients. It is impossible to control the insane as regards expectoration, and this proposed separation is highly desirable.

While this by no means exhausts the offensive measures we may employ against tuberculosis, time forbids that we pursue this part of the subject further, and we will now turn to the defensive measures. As these include everything which makes for a strong healthy body, it would be impossible to even enumerate them. We will consider only those that relate to the masses, and not to the individual.

We may commence with the school children. Are we doing everything possible to preserve and foster their health? What has been found by the investigation of school buildings in New York, in Massachusetts, in Indiana, and in Ohio? They have shown with few exceptions they are sadly lacking as regards their sanitary condition. Many of them are badly lighted, badly ventilated, unclean and overcrowded.

The overcrowding is perhaps the worst evil. A schoolhouse is built that will suitably accommodate 100 pupils. The school population increases, and will often be allowed to reach 200 before the school directors can be persuaded to provide another building. Laws forbidding overcrowding of school buildings should be rigidly enforced.

I can not go into all the evils of school life. You are familiar with them. I would call attention, however, to one point more

especially pertaining to city schools. That is the lack of provision for suitable out of door play grounds. It is the nature of young animals, including children, to play. We can not doubt that this is essential for their healthy growth and development. Give the child time and a place and he will get plenty of exercise, and will need only a little oversight.

I believe there should be a medical man permanently connected with every school. As much attention should be paid to physical development as to the mental side, and the physician should have full control of all matters relating to the former.

I have no doubt that in hundreds, perhaps thousands, of cases the predisposition that has led to the final development of tuberculosis is chargeable to bad school hygiene. On the other hand, if proper attention were given to physical education, and to practical instructions in hygiene by some one who knows something about it and is not compelled to use W. C. T. U. text-books, we could in two or three generations build up a race able in large part to defy the bacillus tuberculosis.

Shall tuberculous teachers and scholars be excluded from schools? Indiana, I believe, has taken the lead in declaring that they shall be. If excluded from school, shall they be excluded from Sunday school, from church, from the theater? Where shall we stop?

The following occurrence will show the danger of permitting a tuberculous scholar to attend school when no precautions are taken to prevent infection. A resident of a small village near Columbus wrote me that twelve pupils attending school there had died of consumption within a few years. He said: "Four boys were allowed to go to school there when they were very sick. They had a high fever and could hardly get up the steps. They went to school there almost until their death. It has been said that they spat on the floor so that the girls covered it over with newspapers to hide it. Strong, healthy girls have died from this disease whose parents never had anything of the kind. This schoolhouse has never been disinfected or properly cleaned or ventilated." A list of the scholars who had died of consumption was given. A letter of inquiry was sent to a physician of the village who verified the above in every particular.

The danger in schools would not be very great if we could in-

sure the proper disposition of the sputa. It is doubtful whether this can be done. But leaving out of consideration the question of infection, the schoolroom is no place for a person with tuberculosis who has still a chance to be cured. The incurables certainly do not belong there.

It is quite probable that other states will follow Indiana's lead. If the State exclude tuberculous children, then some provision should be made for their cure and education.

Another class needs the State's protecting care. We know that certain occupations are especially liable to lead to tuberculosis. Among the worst are those where the air is constantly filled with fine, cutting dust. Most states have inspectors of workshops and factories, but their powers are too limited. Every employer of indoor labor should be compelled to meet certain conditions as regards light, cubic air space, ventilation, etc., and to install dust removing machinery whenever needed. With the anti-spitting rule enforced, and hygienic workshops, both possible, the deaths from tuberculosis among workingmen and women could undoubtedly be much reduced.

Akin to this work is to remedy the horribly bad sanitary conditions of the "slums" of our large cities, the veritable hotbeds of tuberculosis. This is a difficult but not hopeless task, and something is being done in this direction.

Numerous easily accessible parks with no "Keep off the Grass" signs, and penny or free baths are other means for improving the public health and thereby increasing the resistance against tuberculosis, which civic authorities may make use of.

The subject of tuberculous meat and milk can not be entirely ignored. While Koch, whose name will forever be associated with tuberculosis, has recently declared that tuberculosis of animals differs from tuberculosis of man, and is rarely if ever communicated from one to another, he is practically unsupported in this view. For the present we must regard this as a serious danger, and increase rather than relax efforts to protect the public against tuberculous meat and milk. Certainly we have the right to demand that all animals furnishing meat and milk shall be free from all disease including tuberculosis.

Without going further into the subject, I would suggest that a certificate from a competent veterinarian should be exacted

showing that every cow furnishing milk for sale is free from tuberculosis. It would be much more difficult to provide for such a certificate for meat producing animals. Fortunately there is much less danger from tuberculous meat than from tuberculous milk.

A division of the subject remains which at present is of surpassing interest. That is the sanatorium and hospital movement for the cure and care of tuberculous patients. While the cure of tuberculosis does not so nearly concern us as health officers as does the prevention of the disease, it is to the health officer and sanitarian that we must look for leaders in urging the establishment of sanatoria for tuberculosis.

Europe, and especially Germany, has far advanced us in this matter. While there are some private and charitable sanatoria in this country, and hospitals for tuberculosis in many of our large cities, I know of but one real sanatorium for the public and that is the State institution at Rutland, Mass. Other state sanatoria are under way, and the proposal is being earnestly advocated in many states.

Not so many years ago to be told you had tuberculosis was like receiving a death warrant. Today at least one-half of the cases treated early recover. The most important thing taught us by the sanatorium treatment is that climate is a minor, practically negligible, factor in the cure of tuberculosis. What is needed is pure air, and the air of Indiana and Ohio is as pure as the air of Colorado, New Mexico or California.

What armies of hopeful consumptives have journeyed to those far countries expecting this magical thing, climate, to restore them to health. And how many of them we see coming back for burial—on arrival or shortly thereafter! There are advantages, of course, in a climate that tempts patients to be constantly out of doors. Altitude may possibly favor certain cases; but there is no doubt that a State sanatorium here in Indiana can be made to give about as good results as could be obtained in any other State.

The Ohio Tuberculosis Commission, appointed by the last legislature, has unanimously reported in favor of a State sanatorium for the treatment of incipient cases of pulmonary tuberculosis. The incoming legislature will be asked to appoint another commission to select a site and prepare plans for such an institution.

As means of preventing tuberculosis sanatoria are deserving of attention. A sanatorium for 250 patients would probably care for 500 patients each year. Fully 90 per cent. of these would be sent to their homes cured or much improved. Each one would become a teacher of preventive measures in his community. The increasing influence of these living apostles of prevention would be hard to estimate. It would certainly be very great.

In proof of this it may be stated that in communities where sanatoria have been located for some years the death rate from tuberculosis among the villagers has shown marked reduction, as compared with the death rate from this disease in other parts of the same country. The extreme care taken to prevent infection in such an institution, as well as the methods of cure, are object lessons to all observers. In spite of this fact opposition has been met with in attempting to locate a sanatorium for tuberculosis from fear of infection.

Hospitals for the practically incurable cases of tuberculosis are potent agents of prevention. They can receive the cases from the crowded houses of the poor where infection of others is unavoidable if they are permitted to remain. There ought to be a hospital for tuberculosis in every county in the State.

The following case recently coming to my observation shows the great need for such institutions. An old crippled soldier, with a wife and two daughters, were living in a small village in my State. A small pension was their only means of support. The father died, and the mother became ill with tuberculosis. One daughter was able to gain a small wage as stenographer. The other, at home with her mother, contracted tuberculosis. The mother died. There seemed to be absolutely no place for the consumptive daughter. The infirmary was unwilling to receive her. Fortunately, in my home city, Columbus, a few beds in a Catholic hospital had been endowed for tuberculous patients. Endowed, by the way, by a family that had lost two daughters from consumption. There was a vacancy, and the old soldier's daughter was given a comfortable place to die. It was too late for a happier end.

There are thousands of such cases, no doubt. Private charity can reach but few of them. The State, through its county or municipal divisions, should look after them. I am happy to be

able to state that Cincinnati and Cleveland have hospitals for tuberculosis. I hope we may soon see many more of them.

There is a class of patients, especially in large cities, that can be helped only by the dispensary. A dispensary specially for tuberculosis will do the most good. I have in mind a dispensary like the one at the Henry Phipps Institute in Philadelphia. Here are skilled diagnosticians to detect the disease in the early, curable stage. Spit-cups are furnished and full printed instructions for dealing with the sputum, food and even clothing are furnished in special cases.

The workingman, depending on his daily wage to support his family, can rarely arrange to go to a hospital early in his disease, even were a free hospital accessible. He must work for those depending upon him. For this class the dispensary specially devoted to tuberculosis would be a godsend. In connection with a charitable organization, great good could be accomplished. There is no reason why a city no larger than Indianapolis or Columbus might not maintain such an institution.

It is manifest that there must be a uniting of many forces in our combat against tuberculosis. We need wise legislation along many lines. There must be further education of public opinion. Law, Medicine and the Church should assist us. The charitable organizations should be with us, for tuberculosis more than any other disease, is constantly adding to the number who must receive charity. Here, as in disease, prevention is better than cure.

It is a most favorable omen to note the attention that is now being given to the subject of tuberculosis. The medical journal and the daily press are filled with articles upon this subject. Societies for the prevention of tuberculosis, national, state and municipal, are being formed. Sanatoria, for the cure of the disease, are being multiplied in all parts of the world.

Let us, as health officials, push on this great work with confidence that in the end the combat must result in our complete victory.

HEALTH IN THE SCHOOLS.

BY SENECA EGBERT, A. M., M. D., PROFESSOR OF HYGIENE IN THE
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That youth is the time for acquiring health and for laying up a store of that physical capital which will be so much needed in after life, if happiness and success are to be achieved, will not be gainsaid by any one. While it is true that scientific investigation is showing more clearly from year to year the great importance of the role that heredity plays in determining the life history of individuals, the same kind of research and our own everyday experiences are also demonstrating how proper environment and the application of hygienic principles can go far to overcome or improve inherited conditions. Broadly speaking, many children, that a quarter of a century ago would have been passively permitted to pass into a state of chronic invalidism or to an early death, are now the objects of such intelligent care and attention that by the time their adolescent period shall have been well passed they will have at least an equal chance for the future with others who were primarily more fortunate.

But can we say that the great mass of children receive the same hygienic oversight in their development as do the comparatively few whose manifest weaknesses attract and receive our attention? And have they not as much a right to it? Once admit that youth is the time for gaining health and building up sound bodies and constitutions or concede that the applied hygiene of today can do anything in the way of improving the physical condition of the growing individual, and you lay a burden of great responsibilities upon all who have any part in the care of children.

Few realize the large proportion of our population that is now in that period of childhood and adolescence of which I have been speaking. The U. S. Census Report for 1900 states that children fourteen years of age and under comprised 31.3 per cent. of the

total population of the registration area, and that young people of from fifteen to twenty-four make up another 18.9 per cent. If the percentages given hold good for the rest of the country, we had in the census year a total population in the first group of approximately 23,750,000, and in the second group, upwards of 14,350,000. The Commissioner of Education reports the number of pupils enrolled in the common schools for the session of 1902-3 as 16,009,361, which was 70.67 per cent. of the school population; that is, of children from five to eighteen years of age. You thus see what a vast army of young people we have constantly with us to guide and help to sane and hearty manhood and womanhood.

As Americans, we look upon our public school system and its opportunities for popular education as of the utmost importance in the development of good citizens and the maintenance of our free institutions, and I have no doubt that here in Indiana you are as proud of your educational facilities as are the people of any other part of our nation.

Your school population in 1903 was 724,140, of which number 560,523, or 77.41 per cent., were enrolled and 417,077 were in average daily attendance.

What are you doing for them? What can you do that you are not doing to make them better and healthier, both now and in the days to come when they will be the representatives of your great commonwealth? These are the questions that I am to discuss with you today.

Every physician who has much to do with children knows that, while there are certain disorders to which all may be subject, there are other disturbances of health which begin to manifest themselves at the opening of the schools in the autumn, continue throughout the school year, and which are undoubtedly influenced, if not caused, by the school conditions or school work. Sometimes these disturbances are trivial and readily amenable to treatment; sometimes they are more than temporary in their effects and of most serious import as concerning the future of the scholar. In either case, the causes or factors that develop them should be remedied in so far as possible, for no matter how valuable mental education and training may seem to be, there should be nothing

in our system that tends to secure it at the expense of the physical welfare of the growing child or youth.

The proper scheme of education should include the fair and even development of body, mind and morals, for the individual must have the three in harmony to gain the best of life and living. Any sacrifice of one at the expense of either of the others is illogical and unwise. Is there not danger that we may forget this in these high pressure days when the almost universal desire is to acquire everything in the shortest possible time, and to excel in outward show? How many parents forget to give thought to the health of their children in their eagerness to have them through with their schooling and out in the world either as wage-earners or as devotees of society? How many school directors or teachers appreciate the strain upon some of the pupils and the extra burden laid upon them by the addition of a new study or two in the curriculum?

I shall not occupy much of your time in considering severally the disturbances to health and symptoms due to school conditions, for I assume that you already appreciate most of them and their causes. Permit me to mention a few, however, that I may show the importance of an early recognition of them by the teacher as well as by parents and physician.

Headache is a frequent symptom, and may be due to digestive disturbances, imperfect ventilation, eyestrain, overwork, worry or improper habits of posture favoring interference with the circulation. When persistent, each of these factors should be investigated and especially should the eyes be carefully examined to determine whether glasses are needed or whether serious organic trouble is beginning. Sometimes, if the headache continues to be severe, it may be wise or necessary to stop all school work for a time.

Digestive disturbances, manifesting various symptoms, are likely to be traceable to irregular meals or faulty habits of eating and improper meals, and can usually be controlled by the parents rather than the teacher. The school authorities, however, should have some oversight of such scholars as are compelled to remain during the noon or luncheon hour, for the children may, in their eagerness for play, eat too little or too rapidly and ex-

ercise too vigorously immediately afterwards. Those who go home for luncheon should be given full time for that meal and should not be detained for punishment or other reasons at the end of the morning period.

Sleeplessness, restless sleep or bad dreams, when not due to improper feeding or indigestion, indicate possible nerve-strain, with a probable cause of overwork or worry. We should not forget that many children, who really do not have too much work for their physical capacities, are kept in a state of constant anxiety either by the scolding and nagging of an injudicious teacher, or by an unwise ambition to excel others and fear of losing their rank in class. Parents, also, by their harshness and threats of punishment or displeasure, may also intensify this state of nerve-worry and be most to blame for the results that follow. I need not tell you that girls are more apt to be disturbed in this way than boys; nevertheless, many a boy is far more sensitive than those who are nearest to him realize. Where excessive school work is to blame for a nervous manifestation, it is probably that part which is required to be done outside, and not that done in the schoolroom that is most harmful, for which reason the former part should be kept at a minimum and, likewise, extra burdens in the way of music or painting lessons, social dissipation, etc., should be avoided as much as possible during the school term.

Overwork or worry may be etiologic factors in the future development of such maladies as neurasthenia, chorea or epilepsy, although, as Folsom says, "I doubt whether there is an exaggerated prevalence of manifest or well-marked diseases of the nervous system among school children. If due to the school-drill, my impression is that they come for the most part later in life, after the children have left school and because of constitutions weakened during school years, instead of strengthened as they should be."

Likewise, it is probably true that the development of tuberculosis is rarely directly due to the strain of school life; but, knowing as we do the importance of conserving and increasing the vital resistance to the utmost wherever there is a predisposition to this disease, children who have this susceptibility, either inherited or due to their past environment, should be most carefully watched

throughout their entire school life, and the extent of their mental training made subservient to their physical welfare.

The importance of developing proper habits of carriage and posture in school children is one upon which I can scarcely lay too much stress. Whether the cause of spinal or other body deformities be the faulty construction and arrangement of seats and desks, the improper lighting of the schoolrooms, or excessive strain that tends to maintain low vitality, every care should be taken to prevent them, since they go so far toward lessening the efficiency and the happiness of the individual in after life. It is the business of school directors to supply furniture, etc., exactly suited to the scholars' needs, but it is even more important that the teachers should be constantly watchful to prevent even the beginnings of such troubles. As some one has said, "Spinal curvature is not only a product of low vitality, but does harm by permanently fixing vitality at a low standard."

Of course, no seat nor desk will remove original weakness of muscle, nor can you expect to have a child maintain any position, however correct or "normal," for any great length of time; but you can furnish seats in which the children will naturally and frequently assume a good posture, and the teachers can and should watch their pupils carefully in this respect and should also have them go through a calisthenic or "setting-up" drill two or three times daily.

If time permitted I should like to discuss the construction and care of schoolhouses in detail with you. I shall assume, however, that your enlightened public sentiment demands the very best for your children, both in the large cities and in the remotest rural districts, and that in this respect, at least, political or other "graft" does not rob the taxpayer and his family of their just due.

All schoolhouses and schoolrooms should be well-warmed, well-ventilated and well-lighted. The buildings should be on clean, dry and well-drained soil, and removed as far as possible from any nuisances, either physical or moral. If there be no basement, there should be an air-space between the earth and the first floor to prevent dampness and soil-air from entering the rooms, openings being made of ample size in the foundation walls to insure thorough ventilation of the entire space. If there be a basement, it

should be always clean, dry and well-ventilated. If not otherwise occupied, it may be used as a recreation room at recess and noontime in disagreeable weather, although when the latter permits the children should be encouraged to spend these periods in the out-door air. Sometimes it is well for the school to have a lunch room in the basement or elsewhere, as teachers can then supervise in a measure what the scholars eat when away from home, and thus prevent in a measure headaches, attacks of indigestion, etc., that interfere with the school work of the pupils.

The warming of the schoolrooms should preferably be by one of the indirect systems, and may also be made to assist and facilitate the ventilation. Any heating apparatus in the schoolrooms should be so guarded by proper screens as to protect the scholars from burns, and should be so located as to secure an equable temperature throughout the rooms.

The ventilation system should provide at least 30 cubic feet of fresh air per minute, i. e., 1,800 cubic feet per hour, to each student, and this should be supplied without noticeable draught and comfortably warmed in cold weather. Less than the amount of clean air mentioned will not sufficiently dilute the atmospheric impurities, nor can their best work be done by the scholars. Likewise, every room should have plenty of sunlight, and this should be well distributed from windows on at least two sides of the room. If there be too much light, it can be excluded by curtains and blinds, but too little makes the rooms gloomy, depresses the spirits of teacher and pupils alike, and causes eyestrain and the harmful symptoms and effects resulting therefrom. Schoolroom walls should preferably be tinted, not glaring white, and the blackboards should be of dull finish and not located between windows. In fact, the windows should be at the rear or sides of the room and somewhat back of the desks.

Ample, dry and well-ventilated cloak-rooms should also be provided, and they should be so arranged that they can readily be thoroughly cleaned and disinfected when necessary. Preferably, they should not communicate directly with the schoolrooms, and it is also well to provide an individual rack or locker for each pupil, if possible.

Toilet rooms, outhouses, etc., should be kept clean and decent,

and should be under the supervision of some competent person. If in the country, the earth, or pail-closet, should supplant the customary privy vault or cesspool; if the latter must be used, it should be at least fifty feet distant from the schoolhouse, and the underground drainage should positively be away from the latter. The outhouses should be connected with the schoolhouse by means of covered walks or passages, but these should be constantly ventilated through lattice work or open windows.

The water supply of the school should be clean and free from any danger of pollution or infection. If obtained from a shallow well or spring, tests should be made from time to time to determine positively that it is not receiving contamination from surface drainage or a neighboring cesspool. I speak of this particularly, because it is the custom at many country schools to obtain the drinking water from the wells of neighboring farmhouses, which are more than likely to be grossly and dangerously polluted. In case of epidemic or typhoid fever or diarrhœal disease, all water used in the school for drinking purposes should be boiled and cooled, whether it has previously been filtered or not.

Lastly, overcrowding in the schoolrooms should be avoided and every room should be made as cheerful and comfortable as possible. For many children the aesthetic part is by no means the least important of the several phases of education received in the public schools.

We have still to consider our subject from a point of view that I believe is most important of all—that concerning the preparation of the teachers. How can you expect to have health in your schools if your teachers, the temporary guardians of your children, have had almost or absolutely no training or education in the subjects pertaining to school or general hygiene? Of course, I do not presume to know anything of the schools in your State from personal experience, but I have the authority of the United States Commissioner of Education for a little information concerning them.

Consulting his report for 1903, I find that you have two public and seven private normal schools in Indiana, with a total enrollment in the normal courses of 5,337. In addition, 103 were pursuing teachers' training courses in your colleges and universities,

and 154 in your public and private high schools, making a total of 5,594 prospective teachers. The same report states that the entire enrollment (60) of your public normal school here in Indianapolis has "School Hygiene" as part of the course, but does not indicate that any of the 1,216 enrolled at the Terre Haute school pursued this subject. Neither does it inform us as to what proportion of the 6,300 others enrolled in the private normal schools, colleges, etc., of the State have any training of this kind. I am, therefore, compelled to refer to the statistics for the whole country as given in the report, and find that of the 49,175 pupils in the public normal schools, only 10,606, or 21.57 per cent., were studying School Hygiene, and that almost half of these were in the New England States, New York, New Jersey and Pennsylvania, which have only about one-third of the total number enrolled. In other words, of the 32,419 pupils in these schools in other States, only 5,461, or 16.5 per cent., had this subject in their courses of study. Unfortunately, the report is silent as to similar courses offered to or accepted by the 15,000 other students in the private normal schools, colleges and high schools of the country.

As another indication of how slight importance this entire subject is considered in our present-day scheme of education, I would remark that only 10.1 per cent. of the pupils in the public secondary (high) schools of Indiana and 16.5 per cent. of those in the private secondary schools, are recorded as studying physiology, which term includes, I suppose, anatomy and personal hygiene, and represents all the instruction they receive in these important subjects in schools of this class. In fact, the Committee of Ten, on Secondary Schools, in their recommendation to the National Educational Association in 1893, limited the instruction in physiology to one-half year in the four years' course for secondary schools, and at present I know of no normal school in the country in which the importance of this subject is much, if any more, highly appreciated than this.

To me it seems that if we desire to have health in our schools we must first train our teachers to know what health is, how to conserve it, how to care for their pupils so that they may be made physically stronger and not weaker by their school life, and more resistant to harmful influences, how to detect disease in its in-

ciency, and how to instruct intelligently their pupils in the fundamental principles of this great science.

How many do you know who are really competent to teach this subject as it should be taught? In what normal school of your acquaintance have the teachers an opportunity to secure the instruction and training in this respect that they should have? And what reason can we give for not requiring that they should know something more than a mere smattering of the laws of health and the principles of practical hygiene?

We can never make the sanitary advances in this country that we should until the general public is educated to appreciate the importance of hygienic principles. Where should it get that systematic and scientific education along these lines but in our public schools? The students that I have in my own classes are presumably of the average of high school graduates, and, moreover, most of them have a special predilection for subjects pertaining to health and disease, as their choice of medicine as a profession indicates. And yet it is remarkable how little they really know about the simplest questions in hygiene when they first enter the college, although in other branches they be well trained and good students. Some of them have been teachers for years. One of the latter said to me not long ago, "I had no idea that there was so much in hygiene." This kind of experience makes me strongly feel that hygiene is not being taught as it should be in our schools, that the teachers themselves have no conception of its importance, because they have not been properly instructed, and that we are not only missing great opportunities for securing most valuable popular education regarding all questions of health and sanitation, but that we are also actually jeopardizing the welfare of our own children at a period in their lives when they are especially subject to strain and susceptible to malign influences.

In my opinion, there should be in every normal school, whether public or private, most thorough instruction in anatomy, physiology and hygiene as a part of the required course and the diploma or certificate of graduation should not be conferred until this special part of the course has been satisfactorily completed. Nor do I believe that this can be done in a short time, say one-half, or even a whole school year. My experience is that it will take

longer for the average individual to properly appreciate and assimilate the many phases of this triune subject. But the instruction need not be dull, prosaic and uninteresting, as it now is to too many who have had no proper experience concerning it. I am confident that it can be made extremely interesting to any prospective teacher that has his or her heart in the work, and that the teacher can, in turn, make it interesting and vital to the pupils.

In planning such a course for a normal school, I should first of all require a fair practical knowledge of the human body, both as to its structure and its functions. By this I mean more than the mere smattering of detail and unrelated information that often goes by the name of "Physiology," but, on the other hand, not the exhaustive and technical knowledge required by the physician. What is necessary and essential is that intelligent acquaintance with and appreciation of the parts and organs of one's own body that every intelligent person should have for his own safety and welfare. To secure this there should be not only lectures, but considerable laboratory and experimental work in the normal school.

Along with, or immediately following this instruction, there should be a thorough course upon the fundamental principles and practice of personal, domestic and civic hygiene, this including the consideration of such subdivisions of the science as ventilation, house warming, water supplies and water purification, foods and stimulants, the disposal of wastes, the causation and prevention of disease, disinfection, quarantine, clothing, exercise, bathing, etc., etc. Then there must be teaching and training in physical culture, in order that the prospective teacher may not only be able to detect and prevent abnormalitics and deformities from faulty habits of posture, but that he or she may also know how to correct them. This knowledge has another value, for carefully directed body exercises can be made the means of improving the physical tone and stamina of the scholars under a teacher's care.

Lastly, I would have some instruction given in every normal school on the recognition of disease. In fact, I am very glad to accept the suggestion of Dr. Hurty, that I lay special stress upon this point, and I see no reason why it may not be extended to

apply to those who are teaching in your schools at the present time. There are surely many physicians throughout your State who would be willing and glad to instruct the teachers in their respective neighborhoods in the recognition of the early symptoms of disease, and even to show them suitable cases. There need be no risk to the teachers, if they observe simple precautions, nor any violation of professional ethics. In Philadelphia there is a daily visit made to each school by one of the city's district physicians, who examines attending scholars noted as apparently ill by the teachers. Of course, this is only feasible in a large city, and it is more imperative, therefore, that a course in the recognition of disease be given in each normal school and to each teacher. I am glad to learn that here in Indianapolis there is a school inspection made twice weekly, and hope that it will soon be more frequent.

Suppose every normal student were required to receive such comprehensive instruction and training as I have briefly indicated, this extending through at least two years of the normal course, and suppose that they were made to appreciate that hygiene, thus considered, is a live subject, and to feel the same enthusiasm in disseminating its precepts and applying its principles as you do. Would there be any difficulty in teaching our children how and why to observe the laws of health and to properly care for themselves, both now and in the future?

I regret that time does not permit me to discuss this subject more fully with you, for I feel that in this proper education of prospective teachers lies the secret of future progress. Improved sanitation and its consequent results can only come in large measure through popular education, and the most practical means and place for securing the latter is in our public schools. But how can the scholars be instructed when the teachers do not know what to teach? Inquire, therefore, into the work done in every normal school in this State, whether public or private, and learn whether any one of them has a course in hygiene and its allied studies that is as thorough, as comprehensive and as satisfactorily planned as you think it should be. If so, I shall be surprised and pleased, for I know of no such course at present in any school of this kind.

In a paper prepared for the meeting of the American Public Health Association in Havana, a few months ago, I took occasion

to say: "We have had more than two decades of research work in hygiene; its fundamental principles and laws have been elucidated and established. The science of public health has begun to attain its true dignity, and we are achieving glorious results along many diverse paths. But what blocks the sanitary progress more than anything else is public ignorance and carelessness as to the simplest laws and conditions that govern health and disease. Although we look forward to other and even more brilliant discoveries as a result of original research, and although these discoveries will undoubtedly be of value to us, I believe that popular education in matters of hygiene and public health is to-day of greater importance to us as individuals and as a people.

"If this be true we have in the colleges and universities on the one hand, and in the normal schools on the other, powerful agencies already at our disposal for securing a general, thorough and systematic instruction in domestic and public hygiene. Can we not devise means to employ them fully for the good that they can do?"

There remain to be said but a few words concerning school disinfection and quarantine. Rules of the health or school authorities in this respect should have all the force of law, and should be strictly observed and enforced. Moreover, the two authorities should always endeavor to work in harmony and to sustain each other, the health officers, however, having the superior weight and power in case of difference of opinions.

When a case of infectious disease is discovered in a school, or there is reason to suspect that infection may have been brought therein, the room or building should be at once vacated and kept closed to pupils until thoroughly disinfected. This not only serves to prevent the spread of disease, but it also impresses both scholars and parents with the importance of the procedure. Children who are not sick, but who come from homes in which there is infectious disease, should, of course, be debarred from school until all risk of infection is over and proper precautions as to disinfection have been observed. This will cause objection and complaint at times, but the general public will appreciate and approve your firmness in these matters.

Likewise, the requirement of positive evidence of the successful

vaccination of every pupil in both public and private schools can only work for good as a means not only for protecting, but also for educating the public. The sooner that you and the school authorities make the public realize that you consider health more than paramount to everything else in school affairs, the sooner will the people themselves awaken to the importance of all sanitary matters and questions.

This, in fact, should be your endeavor; to do everything possible to promote health and to exalt and magnify its importance in the schools. It is not only that the physical welfare of the scholars may be enhanced, but that they and their parents may be made to understand the value of sound bodies and to appreciate the results of the actual practice of hygiene, that I would have more than ordinary attention devoted to this subject. No matter what has or has not been done in the past, there are opportunities here for great achievements, and possibilities so far-reaching and so potent for good that one would be unwise should he attempt to predict them all, or even to outline their extent.

ADMINISTRATIVE HYGIENE.

BY E. C. LOOMIS, HEALTH OFFICER FOR VERMILION COUNTY,
PERRYVILLE, INDIANA.

It will not require mental digestive tablets to enable the functions of the brain to assimilate the ideas herein presented. Like any other public official, it is needless to say the health officer should be thoroughly informed of his duties and prompt to act as the occasion requires. To know and to do are supreme requisites to win success, the very essence of human advancement and achievement in the several walks of life. It seems proper, therefore, to notice particularly those things in which the judgment of the health officer must determine the right mode of action upon points in which the law is obscure and to note, also, failures of the officer to perform when the law is plain.

For several years contagious diseases have occupied the attention of the health officer more than the ordinary. The prevalence of smallpox in Indiana and other States has demonstrated in many instances the inability of physicians to properly recognize the disease. There might have been some excuse for this state of affairs in the beginning. So much has been written, the subject discussed, argued, patients for inspection, there ought to be no valid reason why smallpox can not be readily recognized. The profession may resent the statement, that as a rule, physicians are not up to the standard, except in a general way, upon diseases of the skin, often regarding them as trivial and not worthy of serious consideration. The health officer should be able to diagnose smallpox with at least reasonable certainty, as he is often called upon to determine the nature of an eruption. Failure on his part to do so, and to name it (to borrow a term which originated with the laity) Cuban itch, contagious impetigo, chickenpox, has cost the State large sums of money, loss of business and human life.

The health officer is also required to disinfect. This should not

be done in a perfunctory way. A house is either disinfected or it is not. The getting ready is an important factor, i. e., attention to details. Formaldehyde candles and solution is probably the best and most effective disinfectant, and if a house is thoroughly saturated with the gas for several hours, after keyholes and cracks are closed, closets, bureau drawers, books, etc., opened, bedding hung over chairs, clothing put into tubs in successive layers with a sprinkling of formaldehyde solution between each, the whole covered with boards to retain the gas, to remain over night, if possible, the officer may take his departure, knowing his work is complete. The experience of the writer is that no case of contagious disease has ever been traced to any room or building so disinfected by him, of the many during the years of holding the office.

While the County Commissioners constitute the Board of Health and should be interested in sanitary conditions, they often hamper the efforts of the secretary by refusing to pay his expense bills, or at least cut them. The new quarantine law is obscure to a degree. Section 11 says: "The expenses, incident to disease prevention, shall be paid by the cities and towns in which the work becomes necessary, and when without the corporation of cities and towns, said expense shall be borne by the county." This is evidently plain enough and yet it is questioned as to the expense of the health officer. I can find nowhere that the expenses of the health officer shall be paid for inspecting the county buildings and for traveling about seeing after things in general. This matter is brought before the convention as "economists" on county boards refuse to allow legitimate expenses, the same regarding the health law as a fraud and a useless waste of public money. The law is clear and provision made that officers attending health officers' conventions shall be paid expenses. It ought to be equally clear for other expense accounts.

It should be the pleasure, as well as the duty, and it is the duty of the health officer, to know the sanitary conditions of the school-houses in his county. The law gives him ample authority to insist that all buildings shall be properly renovated before the opening of them in the fall for school purposes. They should take pains before the opening of schools to mail to each trustee and

teacher the law concerning school sanitation. If complaint is made by anyone of noncompliance, investigate, and if necessary close the school until the order is complied with. This is on the supposition that the commissioners have adopted the rules recommended by the State Board.

In the collection of vital statistics, especially of births, the health officer has trouble. No effective expedient has yet been devised which enables the officer to know that he has all the births for each quarter beyond a doubt. The fee system would undoubtedly secure a perfect report. The idea is, however, Utopian. Dr. Frank Billings, President of the American Medical Association, has said: "The reporting of births, deaths and contagious diseases is absolutely essential for the progress and advancement of medicine. It would be to the honor of all physicians to make these reports. It is a service due not only to the public, but also to medicine itself. It is a service that only physicians can properly perform, and the profession should universally be eager to perform this service." Now, no one for a moment questions the wisdom of what Dr. Billings says, but the truth is physicians will not do it except by repeated "punching," or the county attorney dangled before the vision, and so the grind goes on. The plan adopted is that, as soon as the quarter has closed, each physician in the county is notified by postal card to forward his reports. A few always send reports as the law directs. The postal card notification helps the local health officer of cities and towns to collect. In some instances a third notice is necessary. A personal acquaintance of each physician is valuable as to wording of postal. Please forward, damn and the law illustrates the diplomatic characteristics. At any rate the plan works well inversely, according to the square of the distance. The point is to "punch" them up and keep everlastingly at it until all have made returns. A return postal card does the best service, as the physician can state that he has none to report, which is sometimes the case. If an officer is faithful, nerry, vigilant and progressive his influence is felt. If he has his county well organized his labors are materially lessened.

Health officers whose county borders upon another State sometimes have trouble with undertakers who bring bodies for burial

into Indiana and neglect to obtain burial permits. In Vermilion County this condition has been avoided by notifying foreign undertakers of the law of this State, and that bodies will be disinterred unless a permit is obtained before burial. As the case is now, burial permits are recognized on both sides of the State line and the proper permit issued.

A thorough study of the Book of Instructions to Health Officers and the Monthly Bulletin will enable any officer to perform his duties in a creditable manner. Of course things will come up which the law does not cover, which, if important, can be referred to the Secretary of the State Board. But as a rule be self-reliant and not bother that official with questions which by a little study and reflection you can decide for yourself.

The time of this convention is too valuable to make too long a paper upon this subject. The points touched upon seem to be the ones which give the most trouble; although each county, no doubt, has environments which they do not cover. Privies, hog-pens and nuisances in general have been left, as the law is plain and the duty of the health officer is plain in disposing of them. To be firm, courteous, diplomatic and kindly disposed will carry one over rough places many times with but little jar or jolt. In a word, be a gentleman.

HOW MAY THE CAUSE OF MUNICIPAL SANITATION BE ADVANCED?

BY DR. JOHN N. TAYLOR, CRAWFORDSVILLE, IND.

In answering the above question, I shall endeavor to exhaust neither the subject that has been assigned me, nor the patience of those who listen. I shall, on the contrary, present some points for your consideration, and leave it to you to do the exhausting or not, as you may see fit.

I shall consider:

(1) The health officer himself; his qualifications and the diplomatic use of his powers.

(2) The municipal government in its relation to municipal sanitation.

(3) The public in its relation to both.

Upon the first head I will say that the health officer should be thoroughly qualified for his position, a statement very familiar to you, but which will bear much repetition. The public should possess some means of knowing that he is technically qualified, so that in the administration of his office there may be as little criticism and resistance to the legitimate use of his authority as possible.

The law makes practically no provision whatever for determining the qualification of a health officer, and though custom provides that he shall be a practicing physician, yet experience proves that intelligent laymen may as successfully discharge the duties of the office, since physicians are not taught the principles of public sanitation, and when first entering upon the duties, are as unlearned, save in a few particulars, as are their lay brethren. Indeed, I think that there are some reasons for regarding the layman as having some advantages—he has more time to attend to the clerical work, and is not embarrassed by ethical considerations when called upon to enforce the law that governs the reporting of births, deaths and contagious diseases. Aside from the doubt-

ful provision which custom makes, the choosing of county and city health officers is left entirely in the hands of Boards of County Commissioners and Municipal Councils, and it is superfluous to say that the choice is largely determined by the political affiliations of the applicant, and the commands of those who steer the destinies of that party that happens to be dominant—a condition of things that is often deplored by the board or government that is called upon to stifle its convictions in answer to this demand. On the third of next November the State health service will be twenty-three years old. When first launched upon the “boisterous sea of liberty,” it was almost as an experiment; there were few such in existence, and these mainly confined to the older states, where, because of long usage, authority sits as easily as old shoes upon the public feet. In our own State, however, the State Board of Health led a precarious existence during several years. At each meeting of the Legislature there were certain bucolic statesmen who came charged with the patriotic duty of procuring its abolishment, or in case this might not be accomplished outright, the cutting off of the appropriation, thus procuring death by “inanition.” And they were honest in their convictions. They desired to live as had their sires, undisturbed by encroaching laws that threatened to wrest from them the constitutional right to do as they saw fit, with none to molest or make them afraid—only they had failed to note that population had increased to such a degree that it became necessary to take some steps to keep people from poisoning each other. Another incubus that sat upon the manly bosom of these statesmen was the spectre of taxation without immediate and visible return. A leading senator once declared in the midst of heated debate upon a bill introduced by the State Board of Health, that had it proposed to throw additional protection around the sow and pigs of the farmer, the gentlemen would have accepted it gracefully as a fitting tribute to the worth of those interesting animals; but as it proposed the protection of mere human life, it could be carried only over their lifeless remains.

After many vicissitudes, the health service is now as firmly established as any department of government, and may now reach out for more power wherewith to increase its efficiency. The time is at hand when it should demand a high standard of qualification

for county and city health officers. To this end Section 8 of the Act of '91 should be so amended as to provide that to be eligible to these offices applicants must have certificates of successful examination upon all necessary branches of the science and art of public sanitation, the State Board of Health being the examiner and issuer of said certificate. It should be further provided, in order to encourage the study of this science and art, and to procure a regular attendance upon the sessions of the annual conference, that these certificates be valid for three years, and renewable only upon re-examination.

It is reasonable to suppose that at least three considerable benefits would arise at once as results of this enactment.

1. The public would know that its health officer was a qualified person, who knew his duties. Consequently cavil would be greatly lessened and so, also, resistance to his authority.

2. The number of applicants for these positions would be considerably lessened, and the quality so much improved that the salary would cease to be a humiliation to its recipient, but would measure more nearly the talent employed.

3. Educated and experienced health officers would be more commonly retained, which would insure a better service, and also relieve the local government of the necessity and expense of educating new men in duties which should be understood in the beginning. The neophyte who might desire such office merely as a stepping stone to popular notice would turn his attention to a less arduous course, while those who love the work for the interest it possesses, and because they wish to protect the helpless to the uttermost of their power, would continue in charge.

To facilitate the examination of any and all applicants, Section 5 of the same act should be so amended that the State Board of Health should sit as an examining board at all of its regular meetings, and issue certificates over its own seal and the signs manual of its president and secretary.

Before I leave this part of my subject I desire to say that a resolution to the above effect adopted by this conference, will, in my judgment, be received with favor by the public, which is now advancing rapidly in education along the lines of public sanitation. As to the diplomatic use of his powers by the health of-

ficer, I desire to say that I do not know if the custom still obtains, but in the early history of the service the health officer was much disposed to stand Atlas-like with the whole burden of the public health resting upon his bowed shoulders, and seemed rather to resent the assumption by another of any part of it—this was particularly true of the officer who was serving his first term. By thus isolating himself, he became the target of many free-handed slingers; consequently, if he were timid, he soon reached a point where he would do but little; if he were rash, he did too much, and often found himself at loggerheads with the other authorities, to the detriment of the service which he represented, and if he did too little the consequences might be still more unfortunate. If such conditions exist today they may be remedied by dividing authority with the local board, the municipal council or the chairman of the local board. Some slight eclipse may thus be suffered by the health officer, but diminution in function begets increase in power and lessened responsibility. To illustrate this, let me tell you how public sanitation is administered in the city of Crawfordsville. If the matter in hand be one of moment, such as a threatened epidemic, the board of health is called together, the situation discussed and a course of action resolved upon. If the urgency be great, the chairman of the board waits upon the mayor, informs him of the action of the board and solicits the immediate calling together of the city council for the purpose of considering the recommendation of the board of health. Should such be adopted by the council, it goes out to the public, clothed with an authority that is known and recognized, and the health service has secured a powerful ally in carrying forward its measures. If, as has never yet happened, the municipal council declines to adopt the recommendation of the board, the council itself assumes the responsibilities of the situation, and the board is relieved. If there be no urgency in the case it may go over until the regular meeting of the council. In the ordinary routine work the secretary and chairman of the board act in concert, and the latter is so well informed of the character of it that in the absence of the former the service suffers nothing. The establishment and relief of quarantine is almost wholly committed to the hand of the chairman of the board, who is, of course, a member of the city

council, with authority over the police employed in the health service. As I said a moment since, this system, while it brings into action all of the powers of municipal government, and does so with commendable promptness, yet makes the health officer a less conspicuous figure. But where is there a sensible and conscientious officer who will not suffer diminution of conspicuity to increase the power of this arm of the public service? As to the relation of the municipal government to public sanitation, it may become intimate and active or the reverse, much as the health officer elects. He is *ex officio* a member of that body, his name should be upon the roster, and when called he should be ready to offer such advice or suggestion upon matters that come within his province, as may seem to him suitable to the time and occasion. By pursuing this course it will not be long until he will have the satisfaction of seeing the council taking an interest in sanitary matters, debating them in an intelligent manner and considering them regularly as a part of the routine business. This condition arrived at, it will not prove a difficult matter to procure the enactment of ordinances such as will fill up the hiatuses of the law, and give additional power to the service.

But, unfortunately, ordinances do not execute themselves; there are many in existence which are dead letters, though good and desirable, because there is no constant demand for their execution by parties who interest themselves to that extent. City governments are ordinarily burdened by affairs, oppressed by responsibilities, and more or less under fire of criticism at all times. It is but natural, then, that they should put aside those that are not insistent, to take up those that are imperative. The problem, then, is to make the ordinances relating to the public health as insistent of execution as any other.

- This may be done by enlisting the public through sanitary conventions, lectures and articles in the public press. A number of years since the State Board of Health divided the State into five sanitary districts, assigning to each member one of these according to his place of residence, while the secretary was put in charge of Marion County and the capital. One of the duties of each of these supervisors was to hold, at some convenient point in his district, a sanitary convention annually. These were fairly

well attended and did good in spreading knowledge of the topics discussed, and drawing attention to the work in general. There are, however, agencies now in existence that may be made more potent than these. I speak of the numerous clubs, literary, scientific, social and commercial which now exist in many of the large towns in the State, and will doubtless extend to all. These may be enlisted, and under their auspices public meetings be held for the purpose of hearing lectures delivered upon the cause and prevention of tuberculosis, the danger arising from unclean dairies, the spitting habit and its suppression, etc., etc. Get the public once thoroughly aroused to the importance of these and kindred topics, and existing ordinances will be enforced and others that are needed enacted.

THE RELATION OF THE MEDICAL PROFESSION TO THE RESTRICTION OF TUBERCULOSIS.

BY GEORGE H. GRANT, M. D.*

At the Health Officers' Conference held one year ago, I gave a short account of the work which had been inaugurated in Wayne County in securing reports from physicians of their cases of tuberculosis, and expressed considerable satisfaction that we were pioneers in this work in Indiana.

Believing that possibly good may come from a review of our year's work, and that it will be apropos of the title of this paper, a brief retrospect of what we have encountered in dealing with the medical profession in this matter, is submitted for your consideration.

Let me recapitulate the method employed in introducing the plan, in order that deductions from results may be properly made.

When the revised rules of the State Board of Health appeared, and Rule 12 was found changed to include pulmonary tuberculosis, a circular letter was sent to every physician in the county, calling attention to this fact, informing them that reports of tuberculosis of the respiratory organs were now required, although quarantine was not to follow, and quoting the full rule, with its penalty for violation of the same. The entire rules were then published in the usual method of promulgation—in two papers of different political views, in two issues, a week apart.

These papers circulate throughout the county and one or the other of them is read by nearly every doctor in the county.

Next, professional interest was stimulated in regard to the new requirement, by a free and enthusiastic discussion on the restraint of tuberculosis, in the Wayne County Medical Society.

A resolution was unanimously passed, pledging all the members of the society to report all their cases of tuberculosis; free bacteriological examinations of sputum were offered to all who

*Read before the Indiana State Health Officers' School, June 2, 1905.

were not equipped to make them, and a committee of three was appointed to formulate plans for furthering public education on the matter, their conclusions to be published in all four of the medical magazines in Indiana.

There are about 100 doctors in Wayne County, 56 are members of the Wayne County Medical Society, and over 20 members were present at this meeting. I can not learn that this committee on tuberculosis has ever met.

Finally, after the meeting, another circular letter was sent to every physician in the county, informing them that the county and city health officers required and expected reports on cases then or thereafter under treatment, and in order to get these reports six stamped postal cards, addressed to the county or city health officers, were enclosed. It was assumed that few would have more than six cases under treatment at one time, but more cards were offered when the six were gone.

These cards were blank reports for the name, age, sex, color, residence, number in family, physician and previous physician, and brief accounts of other cases in the same family, if any.

A large number of the circulars of the State Board of Health on the hygiene of tuberculosis, for the patient and his family, were distributed to the physicians, and the offer of free examinations of sputum was repeated.

Finally, this preliminary work having been done with the physicians, in order to secure some attention to the matter from the laity, I gave a popular talk to the County Horticultural Society, largely on the hygiene of tuberculosis, and explained fully what was intended in the proposed method of reporting cases. The society published the address in a newspaper and it was pretty generally distributed over the county.

At different meetings of the County Medical Society, and at various times when in conversation with other members of the profession, both the city health officer, Dr. Davis, and myself, urged the reporting of cases. Thus it is seen that the way was freely opened for the medical profession to co-operate in this work. Now for results.

Following my first request came a full report of all cases under treatment at the Eastern Insane Hospital, Dr. S. E. Smith, superintendent.

This is, as might be expected, from the head of a well-managed institution, where unquestioning observance of all legal requirements is a matter of simple routine. From time to time, as new cases developed, or were admitted, a total of 14 cases was reported up to December 31, 1904, and in this time 4 cases of the disease were fatal.

In the same period of time from the 100 other physicians in Wayne County, and from the 56 other members of the Wayne County Medical Society, were reported exactly the same number of cases—14. These 14 cases were reported by nine different physicians, two of whom were not members of the Medical Society. In the period of time under consideration, May 1 to December 31, '04, there were reported a total of 36 deaths from pulmonary consumption outside of the Insane Hospital, 6 deaths from tubercular peritonitis, 4 from tubercular meningitis, and 3 from tuberculosis of other organs. All of these deaths from tubercular disease in Wayne County, yet only 14 cases reported for record while under treatment.

Of course it is evident that many more than the 36 fatal cases had been under treatment, and it is difficult to estimate how many there probably were, unless we take the ratio of cases and deaths at Easthaven for a guide. If we do so we find that with 14 cases and 4 deaths at Easthaven in a given period of time, there would be 126 cases, with the 36 deaths in Wayne County in the same time.

Doubtless these figures are somewhat excessive, because of the known high rate of tuberculosis among the insane. Yet it is undoubtedly true that there were four or five times as many cases of tuberculosis known and treated as there were reported.

With a view of ascertaining why this failure to secure reports had occurred, and why the anti-tuberculosis movement had been so received, I wrote to a half-dozen physicians in different parts of the county, asking for their conception of the reason for the default. One replied that it was because a microscopic examination of sputum was difficult to obtain; that a single one was often unsatisfactory, at any rate, and hence physicians hesitated to "ostracize their patients by making the report" that they were consumptives.

In view of the repeated offers of free examination of sputum,

both by myself and others, which offer had been accepted by other physicians in the county, there seems little in this objection. Another writes three reasons. (1.) There was no law to compel reports, they being optional with physicians. (2.) Again the uncertainty of diagnosis without the microscope; and (3.) The fear of both doctor and patient of going on record with a diagnosis of tuberculosis.

Concluding his letter, he says: "All these objections can be overcome when tuberculosis cases are required to be reported early, as is the case in smallpox, with a punishment attached for failure, and such a law should be enacted at once." Commenting on this, I would say that this gentleman has received all my letters and circulars, and in them was the full information that Rule 12 was a law, and that there was a fine for violating it; nor was the language of the request for immediate and future reports of cases calculated to create the impression that reports were optional. Here it is: "NOTICE.—It is desired by the State Board of Health that a report be received of all cases of pulmonary tuberculosis and tubercular disease of the respiratory organs now under treatment, or that may hereafter apply for treatment. You will therefore fill out the enclosed card and return to the proper health officer; residents of the city to the city health officer, and of the county to the county health officer. Notify county health officer when out of cards and a supply will be forwarded." This letter came from the man who introduced the resolution in the County Medical Society, pledging all members to report cases.

The superintendent at Easthaven did not consider that the order left matters optional. The information to the two men was identical, but is it not likely that one man consigned his letter to the scrapbasket with about the same attention he gives the prospectuses of those mining companies with only a few shares left?

Another man objected to making the reports on a postal card because, in some offices, the postmaster would read the card, and tell it about that the patient had consumption, so Dr. Blank says.

This may be a valid objection, and apparently it was held by others, because a few reports came enclosed in envelopes.

Another man thought the law ought to be rigidly enforced, but gave five short reasons why it was poorly obeyed, as follows: (1) Lack of understanding of the law; (2) inertia; (3) fear of cen-

sure from the family; (4) the disease being always present, it does not excite activity as do other acute infectious diseases; (5) many doctors think there would be no benefit to humanity, and consequently neglect to act.

This last reason amazed and discouraged me, and I thought he must be unduly pessimistic; but the next letter I received, and the writer was a very careful observer, a man of metropolitan experience, and high professional attainment, gave in substance the same opinion: that but little good would result. His other reason was, the fear of the physician that he would offend by diagnosing tuberculosis.

The last answer I received to my letter of inquiry was a frank admission of unmitigated neglect to report some cases, one of them a fatal one. He was heartily in sympathy with the movement, and had simply failed to comply through apathy.

You will observe from these letters that indifference is the great obstacle to the movement. Almost equal to it is the fear of business damage, mentioned by so many of the correspondents, if they should make and record a diagnosis of tuberculosis. The personal aspects of the case overshadow any idea of public good from attempts at regulation consequent on recording cases. There is little doubt that those who held that public good was unlikely to follow this plan share their opinion with the general medical profession very largely. To me these local conclusions are a demonstration of what Dr. Osler said at the beginning of the anti-tuberculosis work in Baltimore: "Apathy on the part of the medical profession is the worst foe the cause can encounter."

A statement of this kind is likely to be challenged, and requires examination to ascertain what gave it origin, and to know whether it is reliable.

The fear of tuberculosis is so great that many an educated physician, recognizing the disease, will hesitate to inform his patient of that fact, likely contenting himself by warning the family. He knows that if he frankly admits the presence of the disease, or gives hygienic directions as to out-door life, forced feeding, isolation, abstention from personal contact as in kissing, etc., and the many other sanitary measures well known even to the laity, his patient will gloomily ponder the situation for awhile, conclude that the doctor is an alarmist and an impractical extremist, and

will then go to someone else, who will offer more encouragement, with less disagreeable methods of management. As a result of this absence of frankness, absolute personal care of the sputum, which means its destruction while moist, and its careful discharge from the mouth without swallowing it, to reinfect the body, is neglected through lack of instruction. The disease is termed "grippe," or "malaria," or some other euphemism. The patient loses his 58 per cent. chance for arrest of the disease by an open-air life, constantly reinfects himself because he does not know how to guard against autoinfection, infects his room, and becomes a menace to his family and friends.

Gradually declining under the tonic treatment, unless he becomes dissatisfied and goes elsewhere, at length the physician advises a change of climate. Likely the patient will sell off his possessions to make the journey, and he arrives among strangers, lonesome, poor, homesick and discouraged, to find himself surrounded by a crowd afflicted as he now knows himself to be, and all looking for such work as they are able to do, with none finding it. You know how this usually ends.

By no means is this the invariable fact, nor do all physicians deal with the tubercular patient in this manner. Every town has its patients who are living out-of-doors, and who are under the wise care of conscientious physicians, who are safeguarding them and their families. This is particularly true among those not impoverished, and of average intelligence.

It is a matter of observation quite universally, that physicians with a well-established business are slow to inaugurate any method of control that is in connection with an attempt at public record. For some reason this method has always appeared harsh, and an unwarranted intrusion on private affairs. It is equally true that many of them shun as harsh the modern fresh-air treatment, and continue the tonic and cough-mixture plan, paying only a half-hearted attention to a limitation of infection. You will recall that it was from well-established, observing and prosperous physicians that the almost unanimous plaint came, of a fear of business damage, in the correspondence I summarized. This disinclination of the older, more conservative physicians to undertake a hearty attack on tuberculosis, is shown to be universal by the remarks of Dr. Knopf, when he introduced his discussion on tuberculosis at

the last meeting of the American Medical Association. He said: "When a national association for the purpose of fighting tuberculosis was formed, a distinguished professor of Johns Hopkins University said that for the solution of the tuberculosis problem, we must look for enthusiasm to the young men."

Why? Because they are full of the teachings of their laboratories, and of their earnest clinical instructors, and they have observed the tireless efforts to limit the foci of infection in these cases. And because they have not yet learned to be cautious in making a diagnosis from business reasons.

Again, their early cases are likely to be among the poorer classes, and here is the fertile field for the dissemination of the disease, and the best place to begin to fight it. They still have the time and energy to teach and order personal care and prophylaxis in these poorer classes, and thus they inculcate the idea, even if they find that the practice of the idea is but little followed.

Since there seem to be so many obstacles to disseminating information through the medical profession, it has been suggested that the most certain way to reach the early tubercular sufferer is through his daily paper or magazines. The press is a willing and continuous giver of information on this great movement, and has no doubt accomplished much. But newspapers and magazines are primarily commercial enterprises; and they just as willingly and continuously print all manner of harmful advertisements for such charlatans as the Koch Bros., the Shaker X-ray specialists, Golden Discoveries and Cures.

And their advertisements are so positive and reassuring that the great and benevolent stream of hygienic information is thus muddled at its source. The indigent patient, and very often the patient who could pay and should have consulted one of the enthusiastic young members of the profession, buys, instead, a score of bottles of some nostrum, or takes a half-dozen months' treatment of some quack, and meanwhile lives his unhygienic life. Slowly he wastes his scanty chance for recovery, and constantly he scatters his disease all about him, through his unblameworthy ignorance. By and by, when these false beacons to a port of health show themselves in their true light, sick and despairing, he goes to a doctor.

For the patient alone, little or nothing can now be done, but if his doctor will take the trouble to report the case to a health board, and allow it to furnish the invalid with such advice and help as will lessen or remove his danger to those about him, as he becomes confined to his house and room, that doctor will do more good to the cause of preventive medicine than a score of newspaper articles.

This work belongs to us health officers, and, if it can be done, will be of more value in lives and treasure than the magnificent work of the tropical sanitarians in excluding yellow fever and plague. But it can only be done by the aid and willingness of the general profession. We health officers in Indiana have a plain duty in securing this aid. It is not ignorance on the part of the profession that retards the work. They know as well or better than Jacob Riis what a lung-block is. Dr. Trudeau's work, and Dr. Knopf's teachings have not failed to attract their notice. Our legislative commission, to report on the advisability of a public sanatorium, will meet with their co-operation. But it remains for the health officials to jar this inertia, to galvanize this apathy of the medical profession into action. We can do this by putting tuberculosis first on the list in Rule 12, instead of hiding it back of leprosy. Now that the Laboratory of Hygiene is an accomplished fact, we should see that none need shrink from a diagnosis because he can not verify it by the microscope. Heavy machinery starts slowly, and if we now make the start we can confidently hope that in the coming decade we will see tuberculosis as well restricted as are now smallpox and diphtheria. We need feel little discouragement at our scanty results thus far. There were years of scant interest in even reporting deaths, or in the quarantine of scarlet fever. When at length the whole profession is aroused to this matter, it will display the same unselfish devotion and successful effort in overcoming this disease that it has in every humane, uplifting work throughout the world's history.

June 2, 1903.

THE NECESSITY FOR THE ANNUAL SYSTEMATIC EXAMINATION OF SCHOOL CHILDREN'S EYES, EARS, NOSES AND THROATS BY SCHOOL TEACHERS.

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There are in the United States over fifteen million school children, ten million of whom are suffering from some eye, ear, nose or throat defect, which if relieved will place them in much better condition to undergo life's struggles, and to achieve a measurable degree of that success which produces self-respecting citizenship, and relieves the State, county or town of burdensome pauperism. No flight of fancy is required to transform the defective child into the nonsupporting "ne'er do well," the wandering and menacing tramp, or the idle, pleasure-seeking and misery-finding prostitute. The evolution is natural and consequential, and stands as an enduring monument to the benignity of education. A child whose educational progress is embarrassed or almost stopped by reason of physical defects may soon acquire a loathing for education and all that education represents, and the seeds of idleness and irresponsibility thus being sown, may, unless energetically and tactfully controlled, either by parental or surrounding influences, fructify and produce a personality ripe for sinister inoculation. If, therefore, the State can eliminate, control or mitigate the existence of such physical defects in children, and by its parental supervision place such children in a position of reasonable equality with their healthy companions, thus affording them fair opportunities for educational progress, its duties become unmistakably clear, and its investment of public funds for the consummation of such designs, a laudable measure of unquestionable economics. If the direct causes of criminality and pauperism

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could be accurately ascertained, I will venture the opinion that the prevailing etiological factors would be physical defectiveness and social surroundings. If, therefore, either of these can be even materially mitigated, a distinct impression would be made upon criminal and pauper annals, and the problem would become one to be worthily considered by the economist, philanthropist or sociologist. The improving of either physical defects or social surroundings in *adult* life is a problem of almost hopeless perplexity, while if these foes to social prosperity be attacked in the budding periods of human existence, the difficulties are immeasurably mitigated.

Concerning the last of these mundane misfortunes, or the social surroundings of individuals, this paper will have nothing to say, but as a medical man I am intensely interested in the second proposition referring to physical defectiveness, and I sincerely believe that if the relievable bodily abnormalities of children could be eliminated a mighty factor encouraging idleness, poverty and crime, to say nothing of human suffering, would be driven forcefully to obscurity.

"Prevention is better than cure," is an old adage, and is nowhere more truthfully exemplified than in the subject under consideration. The adage might be somewhat altered to read "Prevention is possible a thousand times, while cure is possible but once," and still not stray very far from the truth. So true is this that almost all great reform and philanthropical movements tending toward the physical, mental, moral and sociological uplift of humanity, are surely and inevitably endeavoring to grapple with the subject in the earliest years of children, before the withering and decadent breath of human degeneration has rendered upward and improving conditions well-nigh impossible.

Perhaps nothing more surely indicates the nobility and unselfishness of the medical profession than its recognition of these principles, and its beneficent work in the direction of preventive hygiene and medicine. Its best efforts are directed toward the elimination of disease, thus presenting the only instance in professional or commercial life where strenuous efforts are made to destroy one's own income. While it would be most interesting and instructive to dwell upon the various bodily infirmities of

children that militate against their intellectual, moral and sociological advancement, the space allotted for this paper is all too short to permit of such a digression. The title of my paper indicates that I have come to speak to you upon those ocular and aural defects which deter or prevent the afflicted child from acquiring those educational advantages which properly equip him for the great battle of life, the struggle for existence.

Come with me to the clinic and see a poor child of perhaps some foreign extraction. Notice its attenuated form, its pinched countenance, its bloodless, ill-nourished appearance, its unintelligent, unresponsive aspect, all indicating insufficient nutrition before and after birth, and general lack of proper food, air, care and hygiene during the brief span of its miserable existence.

Examine its eyes with your test-types and ophthalmoscope, and you will perhaps find myopia or hypermetropia of enormous degrees, or a congenital cataract; either doubtless due to pre and post-natal starvation and general neglect. Place this child in a school where physical defects are unrecognized and watch the results. He is unable to see distinctly, and headaches, pain and general discomfiture follow all his efforts at study. He cannot even see the blackboards and charts; printed books are indistinct, or seen with much effort; the faces of his teacher and comrades are blurred; he does not know what is the matter, but he finds it impossible to keep pace with his fellows, and he acquires a hatred for school; his endeavor to acquire an education becomes abortive, he falls behind his class, becomes discouraged and truant, and finally gives up the effort, joins the ranks of street gamins, develops criminal tendencies, is sent to a reformatory that does not reform, and may easily end his life in the penitentiary or on the gallows.

Pass from this defrauded child to another of similar miserable appearance, but with an unusually stupid countenance, produced from enlarged tonsils or adenoid tumors in the throat, which prevent proper nasal breathing, and cause him to keep his mouth open in order to breathe. Eventually he becomes deaf, either through obstructive and catarrhal influences, or on account of chronic middle ear suppuration, which is an actual and constant menace to his life. His general open-mouthed, unintelligent

countenance, coupled with his deafness, lead him to be considered stupid, if not idiotic, an impression which is daily strengthened by his poor educational progress, impossible to overcome, through his unfortunate physical infirmities. Eventually he, likewise, neglects his studies, hates his school, becomes a street habitue, idle and dissipated, and may easily terminate his existence amid crime and its consequences. These are no fancy pictures which I have painted in lurid hues for your delectation, to point the moral of my theme. They are true, living, breathing, pulsating facts that must be familiar to every student of hygiene, criminology, or sociology. If education is worth anything in the broadest sense, and if it passes beyond the borders of dilettanteism, into the broad realms of those influences which stand for human uplift, then it should reach down, down to the very dregs and bottom of the social scale, and pull up the *most* unfortunate of the human race, and place them on a par with their fellowmen. You and I both know that education *will* perform this great evolutionary process, and I claim that it is the inalienable, inborn right of every citizen of this great, magnificent Republic to be placed in a position where an education may be acquired. I also claim that inasmuch as we must look to education to solve many of the criminological and sociological problems of the day, and that the more knowledge is diffused throughout the length and breadth of this land, the happier and better will the land become; that it is the distinct, moral and economic duty of the State to see that educational advantages are afforded wherever such conditions are in anywise possible. I further believe that wherever obstructions exist, blocking the way toward educational acquirements, they should, as far as possible, be dissipated by those guardians of the public welfare having such matters in charge. I believe that public school officials should maintain a strict surveillance over the physical as well as over the intellectual and moral welfare of those children committed to their charge. A large portion of a child's life is spent in school and teachers should, and I believe do, take a sincere and watchful interest in the bodily condition of their pupils. The necessity of such observation is the more accentuated, because a large proportion of such children come from homes of ignorance, filth and vice, where mothers and fathers apparently care but

little for their offspring, and evidently desire to shirk all possible moral responsibility. Under such circumstances the burden should fall upon the shoulders of the State authorities, both medical and educational, whose best endeavors should be taxed in vicariously officiating as both father and mother to those poor unfortunates whose earthly advent has been signalized by distress from birth to older years.

While it is not my intention to unduly magnify or exaggerate the importance of any particular physical defect, and its baneful influence in hindering educational acquirements, I believe it safe and conservative to declare that, aside from mental capacity, nothing is so essential to intellectual progress as sight and hearing, and of these the former must claim the principal position.

It is, therefore, to these two functions of special sense that particular reference will be made in this paper, and while I will not burden you with a large and formidable array of statistical truths, that are now so well understood as to render recapitulation unnecessary, I will trespass upon your time and patience for a brief space of time in order to clarify in your minds, and the minds of others, the history and motives for the tests; a detailed description of which will be given toward the close of this article.

The examination of school children's eyes by regularly appointed ophthalmologists is no novelty. It has been done many times by numerous workers, and conspicuously by Cohn of Germany, and Risley of Philadelphia. The plan of ocular inspection by ophthalmologists, however, while ideal in theory, possesses the disadvantages of the great and unnecessary expenditure of public funds, and the inevitable production of much professional friction. Concerning the first objection: it must be apparent that competent medical men could hardly devote such large amounts of time to annual investigations of this nature, which would practically consume the time of several men in large cities, without at least some compensation, which would necessarily and materially to the school budget, and certainly incompetent men would be undesirable. Relating to the second objection bearing upon the production of professional disturbance and friction, should one or several ophthalmologists be selected to personally examine all the public school children in a given city, it can only be said that such

conditions would be but natural and human. The power thus placed in the hands of one man, or several men, would be enormous, and the opportunities for personal aggrandizement and gain, professionally and financially, so great that but few men could successfully withstand the temptation. It seems unnecessary to dwell at length upon this point, but to physicians who understand such matters throughout their devious and diverging pathways, the objections to the plan of personal inspection of all scholars by practicing physicians seem almost unsurmountable. I, therefore, February 6, 1895, in a paper read before the Minnesota Academy of Medicine, proposed a plan for the *annual systematic* examination of school children's eyes by *school teachers*, which was shortly after placed in operation in the public schools in Minneapolis, St. Paul and other Minnesota cities. December 30, 1897, I read a paper before the Associated Minnesota School Boards in St. Paul, in which I proposed that not only the *eyes* of school children should be annually examined by school teachers, but that the *ear*, *nose* and *throat* should be also examined through the agency of a few simple, pointed and pregnant questions and observations. This paper was supplemented by another, which I read April 9, 1898, before the Chicago Teachers' Club, in which I introduced a new testing card, combining in convenient form not only the Snellen test letters, but also minute and explicit directions to teachers, as to how the tests may be made. The salient features of the tests are that they shall be *systematically* performed *each fall* by *school teachers*. I say "systematically performed" because they should be made as regularly as any other school function, as otherwise their efficacy is almost lost. Many teachers imagine themselves to be enacting their complete duty when they maintain a general supervision of their pupils' ocular and aural conditions, observe palpable defects and occasionally refer their pupils to certain medical advisers. This is good, as far as it goes, but it is totally inadequate as a substitute for carefully arranged questions that, when answered, will disclose the existence of 90 per cent. of serious eye, ear, nose and throat diseases. The occasional superficial and unsystematic observation of pupils' eyes and ears can not be safely substituted for thorough, stereotyped tests that have been thoughtfully and intelligently framed for the de-

tection of disease; and yet many ignorant but well-meaning teachers feel that comprehensive annual tests are entirely unnecessary, forgetting the fact that while conspicuous departures from health may be evident to a casual observer, many serious but hidden conditions are only detected by minute and careful examinations. Besides this, unless the tests are distinctly expected from each teacher, many children will escape thoughtful observation of even the most limited character, for while most teachers take a deep interest in their scholars, and conscientiously endeavor to promote their interests in every way, intellectually, morally and physically, still teachers are frequently seen who regard their profession lightly, and endeavor to get through each day's work with as little personal effort as possible. Under such circumstances it is certainly too much to expect that much time will be given to the investigation of the physical condition of pupils, and the child is, therefore, nearly as much neglected, or subjected to nearly the same degree of lack of intelligent supervision, as can be found in many of the squalid homes of public school children. The tests, therefore, should be uniform and systematic, and should annually include *all* pupils above the first grade, as it has been found impossible to satisfactorily examine quite young children. Some teachers have the impression that a child needs only one examination, but inasmuch as eye, ear, nose and throat diseases may develop from year to year in previously perfectly healthy children, it is essential that each annual test shall include all children above the first grade. The tests should be made early in the fall of the year, and should become an integral part of the regular school curriculum. By making the tests shortly after the opening of the fall term, the physical condition of pupils is early ascertained, and steps can be taken toward the correction of any existing abnormalities. Should parents be warned of the presence of physical defects in their children, and fail to act upon such warning, the teacher will have ample opportunity to counsel child and parent concerning the necessity of a medical consultation, which would hardly be possible if the tests are postponed till the close of school in the spring of the year. Besides this the fall tests will have the advantage of enabling the teacher to co-operate with the physician, in the execution of his advice, and to observe the results of treatment in the afflicted children.

Some objections have been raised to the examinations being made by school teachers, some feeling that parents would object; others that teachers are incompetent, and still others that it is an unjust tax upon the time and energy of the teachers. Concerning the first of these objections: its triviality is almost sufficient for its dismissal, and it need only be said that the tests are absolutely harmless and painless, that no instruments or appliances are used, and that the child is practically not even touched during the examination. Should any child or parent object, however, acquiescence to their wishes should be observed, as compulsion is undesirable, and clashing with parental authority should always, if possible, be avoided. Concerning the incompetency of teachers, I have only to say that anyone who is competent to be a teacher can make the tests with perfect ease. They are absolutely simple and uncomplicated, consisting of such questions as "Does the pupil habitually suffer from inflamed lids or eyes?" "Is the pupil probably cross-eyed?" "Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's Test Types with either eye?" "Does matter (pus) or a foul odor proceed from either ear?" "Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room?" etc., etc. The ascertaining of simple facts of this nature does not require a medical education, and can easily be compassed by anyone of ordinary intelligence and tact, and, strange as it may appear, correct replies to the nine questions specified in the examination instructions will disclose the existence of at least 90 per cent. of serious eye, ear, nose and throat diseases. For instance, the question "Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's Test Types, with either eye?" will disclose the existence of myopia, and many cases of hypermetropia and astigmatism. It will also detect cataract, corneal opacities, optic neuritis and atrophy, many diseases of the vitreous, retina and choroid, etc., etc. The question, "Does the pupil habitually suffer from inflamed lids or eyes?" will detect inflammatory diseases of the cornea, conjunctiva, lids, sclera, iris, etc., etc. The question, "Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room?" detects all forms of deafness, whether due to ear-wax, catarrh, labyrinthine, or middle ear disease, etc. The ques-

tion "Is the pupil an habitual mouth breather?" discloses turbinated and septum diseases, polypi, adenoids, enlarged tonsils, etc.

It will, therefore, be seen that notwithstanding the extreme simplicity of the questions, they are most comprehensive in their character, and are capable of detecting a vast majority of serious eye, ear, nose and throat diseases, and while the teacher can not, and should not, attempt to make a diagnosis of the pupil's malady, she will at least know that *something* is wrong, and this is quite sufficient, the physician consulted will do the rest. In case some abnormal condition is disclosed by the tests the teacher sends the parent a card of warning, stating that some disease is believed to exist, which is not only unfortunate for the child, but will retard the progress of education, and advising the parent to consult the family physician or some specialist, either at the office or free dispensary. It will thus be seen that there is absolutely no reason why an intelligent teacher should feel at all incompetent to make these tests, and it is earnestly hoped that this objection will be now relegated to obscurity.

Concerning the objection to the tests on the ground of its being an unjust tax upon the time and energy of teachers, I have only to say that if the tests are made according to my instructions, this objection is quite as valueless as the others, to which reference has just been made. Some years ago, when the tests were first introduced, the school principals personally performed the work, which, when it is remembered that in many of the city schools there are perhaps 2,000 scholars, became quite a burdensome and protracted labor. I now advise that each teacher examine the pupils in her or his own room, and as there are rarely more than fifty children in a room, the extra work imposed is certainly quite inconsiderable, and can be easily performed by either keeping a few children after school, each day for a week, or, what is much better, having a regular half day set aside each fall by the school superintendent, to be devoted to the tests. In this way it can be seen that the tests can be easily finished in a week or a day, according to the method adopted, for from three to five minutes to a pupil is all the time that is required, and by thus systematizing and subdividing the work amongst the room teachers, all the pupils in a city can be examined in the time specified. Some have suggested that the work be done by school cadets, and this is not a bad plan, but inasmuch

as the room teachers live in closer contact with the children and come to learn their physical defects by daily observation, it would seem as if they were better qualified to answer the questions propounded in the tests, than anyone who might be otherwise designated for the work. I further believe that instead of the tests imposing extra work upon already overworked teachers, that in the end their labor will be materially lightened; for many defective children, who from apparent stupidity induced by unrecognized eye or ear defects, obstructing the way to educational acquirements, are the despair and dread of their teachers who spend hours of time in nerve exhausting labor in the hopeless endeavor to maintain their grades, may be suddenly transformed by glasses, or other eye or ear treatment, from thickest density into intellectual brightness, thus relieving the teacher of at least one burden that sends her home at night in a condition of physical and nervous exhaustion. I am confident that if the eye, ear, nose and throat defects in any room in any school could be eliminated, the work of the teacher would be enormously lightened, and, if this is true, they should be willing, from purely selfish reasons alone, to say nothing of the benefits to be acquired by the pupils, to cheerfully and gladly see that these tests are annually executed.

Some critics fail to commend the results of the tests, because many parents disregard the school warning. This criticism seems rather puerile, and is equivalent to refusing a \$100,000 legacy because \$1,000,000 was not left to the beneficiary. Undoubtedly many parents through ignorance, impecuniosity, pride, neglect, etc., fail to seek medical advice for their children after cards of warning from the school authorities have been received, but on the other hand a large majority of the parents so warned unquestionably do as they are advised, and profit thereby. It has been also observed that most of the parents who primarily ignore the warning, from seeing the beneficial results upon their neighbors' children, or from the awakening of latent parental responsibility, or from some other cause, eventually seek medical advice and become stout advocates of the plan. In any event, even if only a small minority of defective children are benefited by the tests, they are certainly worth while, and the tests should not be abandoned because all parents are not ready to receive them.

Some observers regard the tests lightly because they are fre-

quently abandoned after having been used for one or two seasons. This is a most unjust criticism, and does not in any way argue against the usefulness of the plan, but does emphatically argue in favor of the inexcusable neglect and laxity of the school authorities. There can be no doubt of the enormous utility of the tests when properly and persistently applied, and yet it is but human nature to shirk all possible work, and as most teachers are already overworked, unless the school authorities annually urge, or *demand*, the execution of these tests, they may fall into general disuse, and eventual abandonment. I wish, then, to earnestly plead with those in authority not to leave this matter to the option of individual teachers, but to *require* that the tests become a regular part of the school curriculum, and that they be *annually* performed at the commencement of each fall term. Many teachers object to the tests on account of the elaborate records and statistics suggested or required in some cities where the plan has been adopted. When I first proposed the tests I advocated rather elaborate statistical records, to be kept by the school teachers. Experience has, however, considerably dampened my ardor in this direction, and I now recommend the very simplest records or none at all. A multiplicity of records can scarcely aid us in deductions which are already trite, and from the examination of thousands of teachers' reports I can hardly recommend them as very valuable from a medical standpoint. To my mind they represent more useless work than actual value, and, while some records should possibly be retained, I would advocate that they be of the most elementary character, perhaps simply giving the names of the pupils, and whether a card of warning was given, and whether it was for an eye, ear, nose or throat defect. This brief report could be handed to the school principal, and then to the school superintendent, and would simply show that the tests had been made, which is really about all that is necessary. I wish to emphatically urge that the less elaborate the tests can be made in every way, the more surely will they be performed, and that there is no surer method of defeating the end in view than by elaborating and embellishing what should be a simple and uncomplicated affair.

Some observers have raised the objection that until the tests can be legally enforced by act of legislature, it is useless to advocate

their adoption by school and health authorities, as they will not be performed except under compulsion. This argument seems almost an insult to intelligence and benevolence, and I am well convinced that when boards of health, boards of education, school superintendents, school principals and school teachers once become convinced of the usefulness and necessity of the tests, and the ease with which they can be accomplished, legal authority will not be needed to enforce their adoption. Be that as it may, however, and admitting that legal enforcement by the State legislature, as has been accomplished in Connecticut, is the best method of securing the end in view (a statement which I am not at all prepared to accept), certainly there can be no better process by which to popularize the movement than by first appealing to the intelligence of health and educational boards, school authorities and the people at large.

Some critics have objected to the tests on account of their expense. In the first place, even if the expense was multiplied many times its actual amount, this objection should shame the objector when the enormous possibility for good, resident in the tests, is considered. Besides this the expense is so small that it should not for one moment be considered, as, even for a large city containing 5,000 schoolrooms, the expense need not exceed \$100 a year after the first year. Each schoolroom should possess a testing chart, which will be subsequently described. When purchased in large quantities these charts, with teachers' instructions attached, can be purchased for \$80 a thousand. A city with 5,000 schoolrooms can, therefore, be supplied with a chart for every room for \$400. After being used the charts can be carefully laid away and preserved for future use, so that new charts will only be necessary once in several years. The only other expense will be for the warning cards to be sent to parents, and the simple report blanks, to be retained at school, which for even a large city could not exceed \$100 a year.

I have been at work on this movement ever since 1895, endeavoring to perfect and simplify the plan, and to secure its adoption in the various cities and States. Over 10,000 mailed communications of various kinds, including letters, circulars, etc., have passed out of my office during that time. Much encourage-

ment and, I am sorry to say, considerable opposition, chiefly of a professional nature, has been encountered; but the work has gone steadily on, and to-day the tests are quite generally used throughout the United States, and in some cities of Europe and Asia. At the last meeting of the American Medical Association, held in New Orleans, May, 1903, I secured the passage of the following resolutions, both by the Ophthalmological Section and the House of Delegates:

"Whereas, The value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures; therefore, be it

"Resolved, That it is the sense of the American Medical Association that measures be taken by boards of health, boards of education and school authorities, and, where possible, legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipency may be discovered and corrected."

I sent a copy of this resolution to the president and secretary of every State medical society in the United States, and asked them to secure its adoption at their next meeting, believing that the favorable action of the American Medical Association and the various State medical societies would be a strong argument to the different State boards of health and education. Nearly every State medical society which has convened since the last meeting of the American Medical Association has passed the resolution, and I am gratified to here enumerate them: South Dakota, Michigan, Montana, Delaware, Minnesota, Colorado and New York, the Southwestern Missouri Medical Association and the Mississippi Valley Medical Association have also passed them, and I believe that practically all the other States will do likewise as their annual meetings occur.

I have also communicated with every president and secretary of every State board of health and State board of education in the United States, sent them the resolution, stated the necessity for the tests, handed them a question blank to be made out, and asked them to pass the resolution and set the plan in operation in their

several States. I also sent them a circular, containing a description of the tests, which has been for a year or more sent out by the Illinois Board of Health to all county superintendents of schools, requesting them to place the plan in operation in their various counties. I also sent them a circular issued by Mr. Almer Coe, of 74 State street, Chicago, Ill., giving prices for the test cards, with teachers' instructions attached.

As a result of these communications and inquiries, I found that while the tests were being quite generally used from one end of the country to the other, they were being systematically used only in Connecticut (under a State law), New York (under the State Board of Health), and Illinois, where I had, a year or so ago, secured their adoption by the State Board of Health. Shortly after my communications had been distributed, however, the State Board of Education of Texas passed the resolution and placed the tests in operation in that State. The State Board of Health of Montana, a few weeks ago, also adopted the resolution and placed the tests in operation in that State.

I secured the adoption of these resolutions last October at the meetings of the State and Provincial Boards of Health of North America, and the American Public Health Association, feeling that as the membership of these societies is composed of members of the different health boards in the various States, that they would return home convinced of the usefulness and necessity for the plan, and secure definite action at their next State board meetings. Nor have I been disappointed, for in reply to another urgent appeal sent to the various State boards of health officers early in November, I have already received replies from Wisconsin, Minnesota, Indiana, South Dakota, Michigan, Florida, Kansas, Colorado and Ohio, telling me that at the next meeting of the boards the resolution will be adopted and the tests placed in operation generally, after the manner indicated by the Illinois circular. As soon as I have still further good news to report I shall again appeal to the various boards of education, telling them of the action of the boards of health throughout the country, and urging them to unite with them in this most laudable undertaking. I shall again appeal to boards of health who have not adopted the plan, and also to the various State medical societies as they meet

from time to time. In a word, I am confident that at the next meeting of the American Medical Association, in June, I shall be able to report that the plan has been endorsed by almost every State medical society in this country, and is in operation in almost every State, under the supervision of the several boards of health and education.

Having now gone over the subject as fully as seems desirable under the circumstances, and endeavored to answer most of the important objections to the tests that have been, from time to time enumerated, I will now endeavor to describe the details of the tests and demonstrate the ease and facility with which they may be accomplished.

The chart which I recommend contains the ordinary test letters of Snellen, so constructed as to size as to be seen by a normal eye at certain definite distances. For instance, the line marked 20 should be seen by a normal eye at twenty feet, producing vision which is designated by the fraction 20-20. The line marked 100 should be seen by a normal eye at 100 feet, etc. Should, however, an eye be able only to read, let us say, the line marked 70 at twenty feet, the vision would be expressed by the fraction 20-70, or if an eye should possess better than normal vision, and be able to read the line marked 15 at twenty feet, the vision would be expressed by the fraction 20-15. The distance between the child and the chart always constitutes the numerator of the fraction, while the smallest line which the child reads constitutes the denominator. If even the largest number marked 200 can not be seen at twenty feet, the vision may be expressed by ascertaining the distance at which fingers can be counted. It sometimes happens that fingers can not be seen, and that vision is reduced to a mere perception of light, or even to total blindness. The reason for testing vision at twenty feet is simply because this is usually a convenient distance, and is the distance used the world over for this purpose; it is well, therefore, to adopt the customs already in vogue.

Below the testing letters of the chart will be found the teachers' instructions as to how the tests may be made, this portion of the chart being separated from the Snellen's Test Types by a half broken line through which the teacher should separate the upper

from the lower card, the former of which should be hung on the wall when the tests are in progress, and the latter retained on her desk for guidance.

The card of instruction reads as follows:

Please detach by breaking on this line.

INSTRUCTIONS FOR THE EXAMINATION OF SCHOOL CHILDREN'S EYES, EARS, ETC.

(After the method proposed by Dr. Frank Allport, of Chicago, Ill.)

For use of teachers, principals, etc.

Do not expose the card except when in use, as familiarity with its face, leads children to learn the letters "by heart."

First grade children need not be examined.

The examination should be made privately and singly.

Children already wearing glasses should be tested with such glasses properly adjusted on the face.

Place a card of Snellen's Test Types on the wall in a good light; do not allow the face of the card to be covered with glass.

The line marked XX (20) should be seen at twenty feet, therefore place the pupil twenty feet from the card.

Each eye should be examined separately.

Hold a card over one eye while the other is being examined. Do not press upon the covered eye, as the pressure might induce an incorrect examination.

Have the pupil begin at the top of the test card and read aloud down as far as he can, first with one eye and then with the other.

FACTS TO BE ASCERTAINED.

1. Does the pupil habitually suffer from inflamed lids or eyes?
2. Does the pupil fail to read a majority of the letters in the number XX (20) line of the Snellen's Test Types, with either eye?
3. Do the eyes and head habitually grow weary and painful after study?
4. Is the pupil probably "cross-eyed?"
5. Does the pupil complain of earache in either ear?
6. Does matter (pus) or a foul odor proceed from either ear?
7. Does the pupil fail to hear an ordinary voice at twenty feet in a quiet room? Each ear should be tested by having the pupil hold his hand over first one ear and then the other. The pupil should close his eyes during the test.
8. Is the pupil frequently subject to "colds in the head and discharges from the nose and throat?"
9. Is the pupil an habitual "mouth-breather?"

If an affirmative answer is found to any of these questions, the pupil

should be given a card of warning to be handed to the parent, which should read something like this: . . .

CARD OF WARNING TO PARENTS.

After due consideration, it is believed that your child has some eye, ear, nose and throat disease, for which your family physician or some specialist should be at once consulted. It is earnestly requested that this matter be not neglected.

Respectfully,

.....
School

If only an eye disease is suspected, the words "ear, nose and throat" should be crossed off; if only an ear disease is suspected the words "eye, nose and throat" should be crossed off; if only a nose and throat disease is suspected the words "eye and ear" should be crossed off.

It will be observed that these cards are nonobligatory in their nature. They do not require anything of the parent, who is at perfect liberty to take notice of the warning card or not, as he sees fit. They simply warn the parent that a probable disease exists, thus placing the responsibility upon the parent.

Nevertheless if parents neglect the warning thus conveyed the teacher should, from time to time, endeavor to convince such parents of the advisability of medical counsel. Teachers are urged to impress upon pupils and parents the necessity for consulting reputable physicians.

These tests should be made annually at the beginning of the fall term, and should include all children above the first grade.

Each teacher should examine all the children in his or her own room, and should report the results of such examinations to the principal.

The following simple form of report to be filled out by the teacher and handed to the principal is suggested:

THE VALUE AND IMPORTANCE OF VITAL STATISTICS.

BY A. S. TILFORD, M. D., OF MARTINSVILLE, IND.

The mere fact that a certain number of persons died, or a certain number of children were born in a given locality, in a specified time, is not of itself of very much importance.

But the number of deaths, with their causes, together with the number of cases of sickness, and kind and all the circumstances attending, is beyond any question of the utmost importance, as upon such small facts large inferences depend.

Dr. Wm. Farr, the father of vital statistics, to whom we are indebted for the system of vital statistical reports that are now common, says:

"The deaths and causes of deaths are scientific facts which admit of numerical analysis; and science has nothing to offer more inviting in speculation than the laws of vitality. The variations of those laws in the two sexes at different ages, and the influence of civilization, occupation, locality, seasons and other physical agencies, either in generating diseases and inducing death, or in improving the public health."

Each and everything in connection with a death should be studied, as related to all other things which caused the death. The disease itself, the age, sex, season, locality, etc.

When this is done you have an accurate basis of facts. Dr. Chas. A. Lindsley says:

"The collection of the facts connected with the vital statistics bears the same relation to the sanitary administration of the State that the ledger does to the business of the merchant. Such statistics have an enduring and continuous use. There is a consensus of opinion among all sanitarians that modern sanitary science owes its present advancement to the registration of deaths and causes of deaths and the conditions and localities in which they

have occurred. It must necessarily furnish the basis of all sanitary reforms, and especially direct the course of sanitary legislation."

What are some of the uses of vital statistics? The information obtained is of use in many ways. The mass of material is valuable, while such as would be accessible to an individual would be of little value. Statistics enable the health boards to record all deaths, together with the necessary information, so that the rate of mortality can be determined with accuracy. From such statistics deaths from preventable diseases can be separated and pointed out as unnecessary waste of life. The unnecessary loss of life from such causes is of the greatest importance.

At the same time this work impresses upon our mind the great principle that prevention is more scientific than curing disease. Warning can be given of the occurrence of epidemics, and of the appearance of communicable diseases dangerous to the public health. Communicable diseases may be quarantined, and the spread of infectious diseases thereby prevented.

That the disinfection of infected dwellings comes directly under the control of the health board.

A system of vital statistics lessens crime by making it difficult to dispose of the victim. It is one of the avenues by which crime is detected.

In military affairs, a scout is sent to a distance before an army, for the purpose of observing the motions of an enemy or discovering any danger. He gives notice to the commanding officer so that he may be better enabled to combat the enemy. So it is with us; by means of vital statistics, a scout as it were, in fighting disease and death. We are in possession of the motions, locality, etc., of disease, the enemy of mankind. We can see the approaching danger and are better enabled to ward off the foe.

There is not a day in the long calendar of the year that the records of vital statistics are not essential. In the settlement of estates, in adjusting life insurance, in pension claims, especially the widow's claim, they are of the highest value.

For instance—a pension examiner or agent calls on a health officer for a certificate of death, and birth of minor children of a deceased soldier; certificates are wanted for the purpose of estab-

lishing the death and cause of death of the soldier, and to prove that he left minor children, to enable the widow to obtain a pension. Possibly the physician, who attended at the birth, was a man who regarded the collection of vital statistics as a humbug, and of no value, and failed to report the birth of those children. What's to be done? Possibly the family have moved out of the country where they were born. Can't you see how much extra trouble that poor woman is caused, in going back to the old neighborhood where they lived and getting two or three women to make affidavit that they know the ages of those children? All of which could have been avoided by the physician doing his duty.

All of this work could have been done in a few moments, which caused this poor woman possibly weeks to obtain, to say nothing of the expense she was scarcely able to defray.

'Tis something she should have had for the asking. In some of the European countries, parents are required to report births within eight days, and a child that has not been reported meets with serious obstacles as he grows up. He can not enter school without presenting his certificate of birth—is not allowed to marry—is almost an outcast. Fortunately, under the present law and manner of collecting certificates of death, this rarely occurs as to death certificates.

Life insurance companies depend on vital statistics for the foundation of their workings. By these, they determine the expectancy of life and are enabled to fix certain rates according to age, occupation, location, etc. The acceptance of a risk must come within a certain limit, which is also regulated by the same statistics, and before a claim is adjusted, they require a certificate of death of the insured.

So as time progresses, these records become more and more valuable, and are depended upon for information in the ways I have indicated above.

Take the older works of practice, and you will not find the author quoting this or that disease as having a death rate of a certain per cent. Little attention was paid to the rate of mortality, no data collected; they were satisfied with what their own personal experience taught them.

Scientific investigation of diseases and means for the preserva-

tion of the public health in the United States is of quite recent growth. The first national legislation was about the beginning of the civil war. But no State Board of Health was organized until 1869, when Massachusetts took the lead.

Dr. Charles V. Chapin has said: "The registration of vital statistics is the firm basis on which the whole structure of sanitary science and practice must rest. In order to learn the laws of disease, to devise remedies and test them, we must have an approximately accurate knowledge of the movements of population and of the causes of death."

Through several centuries there were laws for the punishment of witchcraft and the like, which was then acknowledged as one of the chief causes of epidemic diseases. Ignorant superstition often gave rise to the idea that they had poisoned the wells, and they fell victims to the fanaticism of the times.

Would not the study of sanitation and sanitary laws have saved many a poor unfortunate, also? The darkest page in American history is that which bears the record of the Salem Witchcraft. Five women were hanged in one day. In all, twenty victims were hurried to their doom on Witches' Hill, west of Salem, Mass., the scene of the most fatal delusion of modern times. The accused were put to death, not for being witches or wizards, but for denying the reality of witchcraft.

Scrape off the dust of ignorance, the cobwebs of credulity and the moss of superstition, and we may verify the bare truth itself through sanitary science. It seems as though it requires object lessons of certain kinds to stimulate the people to investigate and search for the truth. In this country, it took the civil war to bring about conditions to advance sanitary science. Such work is always stimulated and advanced by epidemics.

It is the province of sanitation to seek out and determine the cause of disease, and formulate rules for their prevention, and removal, and as such rules are followed, the rate of mortality will lessen. Just so far as the statistics of a nation, state or what not approach perfection, just so far are the people advancing, or vice versa. By vital statistics, the onward strides of the medical profession can be observed. You can point out its successes and its failures.

A century ago, ships could hardly keep the sea for scurvy, and hospitals, prisons and the like were the hotbeds of fatal diseases. The improvement is all due to sanitary science. A knowledge of the causes and modes of propagation of diseases is necessary in order to provide rules for its prevention. This is what is looked forward to, the end to be attained, from the analysis of the available data, the study of which gives direction to our work where it may be of most profit to the public health.

The material necessary for such research includes records of marriages, births, deaths, and sickness, together with accurate information as to the population, among which the events so recorded have happened. The record of marriages is of importance in connection with questions of legitimacy, of inheritance, of kinship and as a means of the detection of bigamy, and the protection of the wife and mother.

The collection of the certificates of death are possibly at this time, as complete as can be desired. But the registration of births could be greatly improved, and those of sickness should be more general. The collection of sickness statistics should include not only the contagious diseases, but all diseases, especially diseases from preventable causes. The greatest hindrance to this is like all other branches of health administration, the lack of financial support.

This in a way could be overcome if the free use of the mails were obtained for all returns, and communications relating to health administration through boards of health. A vast majority of physicians complain of having to make reports and pay postage. I believe if this were granted, very few cases of sickness, births or deaths, would go unrecorded. An effort of this kind should be made to obtain from the controlling power, the free use of the mails for the work.

We enter this world by no will of our own, the law regulates the marriage that makes our birth legitimate. So it is with our demise; the law regulates the disposal. Every individual is entitled to have this much of a record, and but few of us will have any other.

INDEX.

	Page
Atlanta, to Make Sanitary Inspection of Schoolhouse.....	11
Arcadia, Account of Lecture to Hamilton County Farmers' Institute..	22
Auburn, Account of Sanitary Conditions of Town.....	89
Anderson, Lecture to Teachers' Institute.....	91
 Board Meetings—	
Special Meeting, First Quarter.....	9
Regular and Special Meeting, Second Quarter.....	18
Special Meeting	26
Special Meeting	30
Regular Meeting, Third Quarter	37
Special Meeting, Fourth Quarter.....	73
Regular meeting	86
Bloomington, Lecture on "Tuberculosis in Indiana".....	13
Brazil, Account Sanitary Conditions of County.....	38
 Colfax, Account of Smallpox.....	 21
Condemnation of Loogootee Schoolhouse.....	24
Coatesville—Inspection of Schoolhouse.....	32
Proclamation of Condemnation.....	35
Condemnation of Sharpville Schoolhouse.....	35
Conference of State and Provincial Boards of Health.....	39
Connersville, Account of Smallpox.....	45
Columbus, Account of Smallpox.....	45
Car Sanitation—	
Rules and Recommendations.....	48
Placards Displayed	49
Spitting on Floor Forbidden.....	50
Health Notice	51
Disinfection of Cars.....	52
Columbus, Account of Smallpox.....	89
Chart No. 1—Principal Causes of Death.....	149
Chart No. 2—Comparison of 1905, with Average.....	152
Chart No. 3—Comparison by Months	154
Chart No. 4—Comparison by Ages	154
Chart No. 5—Tuberculosis by Months	155
Chart No. 6—Tuberculosis by Ages	155
Chart No. 7—Comparison of Pneumonia for 1905, with Average....	161
Chart No. 8—Pneumonia by Months.....	162
Chart No. 9—Pneumonia by Ages	163
Chart No. 10—Comparison of 1905, with Average.....	163
Chart No. 11—Comparison by Ages.....	164
Chart No. 12—Typhoid Fever by Months.....	167

	Page
Chart No. 13—Typhoid Fever by Ages.....	167
Chart No. 14—Comparison by Months	168
Chart No. 15—Comparison of 1905, with Average.....	169
Chart No. 16—Comparison by Ages.....	170
Chart No. 17—Diphtheria—Comparison, with Average.....	173
Chart No. 18—Diphtheria and Croup by Months.....	174
Chart No. 19—Diphtheria and Croup by Ages.....	174
Chart No. 20—Scarlet Fever by Months.....	175
Chart No. 21—Scarlet Fever by Ages.....	176
Chart No. 22—Comparison of 1905, with Average.....	177
Chart No. 23—Diarrheal Diseases	179
Chart No. 24—Diarrheal Diseases by Months.....	180
Chart No. 25—Diarrheal Diseases by Ages.....	180
Chart No. 26—Diarrheal Diseases by Ages.....	181
Chart No. 27—Cancer, Comparison of 1905, with Average.....	183
Chart No. 28—Compares Cancer, Typhoid and Tuberculosis.....	184
Chart No. 29—Influenza by Months.....	185
Chart No. 30—Influenza by Ages.....	185
Chart No. 31—Violence—Comparison, with Average.....	186
Cancer, Deaths from.....	182
 Diphtheria Outbreak at Noblesville.....	 13
Danville, Lecture to Teachers' Institute.....	91
Diarrheal Diseases	178
Deaths by Months.....	182
Disease Prevalence—Record by Months.....	194
 Epidemics	 7
Eaton, Account Sanitary Conditions of Schoolhouse.....	87
Etna Green, Typhoid Fever.....	97
Water Analyzed	101
Driven Wells	101
Epidemics in Indiana in 1904—	
Smallpox	114
Diphtheria	114
Scarlet Fever	114
Typhoid Fever	114
Diarrheal Diseases	115
Pneumonia—Average Number of Deaths, 5 Years.....	115
Number of Pneumonia Deaths in 1904.....	115
 Forms of Application for Marriage License.....	 27
Food and Drug Rules—	
Explanatory	53
Definitions	54
Animal Products	55
Meats	55
Manufactured Meats	55

	Page
Lard	56
Milk and its Products.....	56
Milk or Butter Fat.....	57
Cream	58
Butter	58
Cheese	58
Miscellaneous Milk Products	59
Vegetable Products—Grain	59
Fruit and Fruit Products.....	60
Flavoring Extracts	60
Olive Oil	61
Sugars and Related Substances.....	61
Glucose Products	62
Candy	63
Honey	64
Spices	64
Cayenne and Red Peppers.....	64
Pepper	67
Cocoa and Cocoa Products.....	68
Coffee	68
Tea	69
Fruit Juices	69
Vinegar	70
Miscellaneous Food Products—Baking Powder.....	71
Catsups	72
Antiseptics	72
Ft. Wayne Account Sanitary Conditions of County Jail.....	88
Fiscal Report—	
State Board of Health.....	102
Laboratory of Hygiene, Maintenance.....	107
Laboratory of Hygiene, Equipment.....	109
Greencastle, Lecture on "Tuberculosis in Indiana".....	13
Hope, Sanitary Survey of Schoolhouse.....	30
Inspection of Schoolhouse at Coatesville	32
Inspection of Schoolhouse at Sharpsville	34
Inspection of Schoolhouse at Atlanta	11
Inspection of Schoolhouse at Hope	30
Inspection of Schoolhouse at Loogootee	20
Influenza, Deaths	184
Kentland, Public Lecture on Hygiene.....	12
Knightstown Paper Company.....	46
Knightstown Strawboard Company—	
Permit to Discharge Waste Water.....	47
Laboratory Work	14

	Page
Laws Passed During Last Legislature—	
Industrial School for Girls.....	19
Village for Epileptics	19
County Hospitals	19
Youth and Dance Halls.....	19
Laboratory Work	20
Loogootee, Inspection of Schoolhouse.....	20
Lafayette, Lecture at Purdue University.....	22
Laboratory of Hygiene	24
Assignment of Rooms	45
 Meetings of the Board.....	 5
Special Meeting	9
Second Session	9
Regular Meeting	18
Special Meeting	26
Special Meeting	30
Regular Meeting	37
Special Meeting	73
Regular Meeting	86
Muncie, in Regard to the Water Supply.....	12
Meeting of the American Public Health Association.....	86
Martinsville, Account Sanitary Work in City.....	91
 Noblesville, Outbreak of Diphtheria.....	 13
New Palestine, Account of Smallpox.....	23
National Association for the Study and Prevention of Tuberculosis..	40
Pathological Exhibits	44
Nashville, Account Sanitary Inspection of Schoolhouses.....	90
 Permits to Discharge Waste Into Streams—	
T. A. Snyder Preservative Co., Tipton.....	14
Permit to Discharge Waste Water Into Cicero Creek.....	15
Permit to Discharge Water Into Mississinewa River.....	16
Permit to Discharge Waste Water Into Duck Creek.....	16
Permit to Discharge Liquid Wastes Into Kill Buck Creek.....	17
Princeton and Oakland City, Regarding Drainage, and General Sanitary Matters	23
Proclamations of Condemnation of Schoolhouse.....	35
Hope	35
Coatesville	35
Sharpsville	35
Permit of J. T. Polk Company.....	36
Pneumonia, Table Giving Comparison.....	160
Pneumonia, Record by Months.....	164
Papers Read Before Health Officers' Schools—	
"Stream Pollution and Remedial Policy".....	287
"Effect of Sewage on Indiana Streams and How to Remedy It".....	295

	Page
"The Problem of Preventing Tuberculosis".....	309
"Insects as Factors in the Spread of Disease".....	319
"The Combat Against Tuberculosis".....	329
"Health in the Schools".....	341
"Administrative Hygiene".....	354
"How May the Cause of Municipal Sanitation be Advanced "....	358
"The Relation of the Medical Profession to Restriction of Tuberculosis"	364
"Necessity for Annual Examination of School Children's Eyes, Ears, Noses and Throats, by Teachers".....	372
"Instructions for Examination of Children's Eyes, Ears," etc....	387
"The Value and Importance of Vital Statistics".....	390
Registration Law	7
Regular Quarterly Meeting of Board.....	10
Report of Secretary for Quarter.....	10
Report of Secretary for Second Quarter.....	19
Resolution Regarding Drainage of Bruce Lake.....	29
Report of Secretary for Third Quarter.....	37
Report of Health Officers' School.....	37
Report of Typhoid Fever Epidemic at State Soldiers' Home.....	73
Rules of State Board of Health Governing Chemical Analyses and Pathological and Bacteriological Examinations—	
Water, Food and Drug Analyses.....	82
Pathological and Bacteriological Examinations.....	83
Instructions to Inspectors.....	84
Inspection of Dairies and Factories Manufacturing Foods.....	85
Inspection of Meats, Fruits and Vegetables.....	85
Report of Secretary for Fourth Quarter.....	86
Report of Chemical Laboratory—	
Establishment	93
Collection of Samples	93
Distribution of Food Law.....	93
Water Supply of State.....	94
Report of Typhoid Fever in Union County.....	94
Report of Typhoid Fever at Etna Green.....	97
Report on State Medicine and Hygiene—	
Laws Pertaining to State Medicine.....	111
Court Decisions Concerning Medical Law.....	111
Dental Court Decisions.....	112
Pharmaceutical Decisions	112
State Laboratory of Hygiene.....	112
State Tuberculosis Commission.....	112
Laws Indirectly Relating to Hygiene.....	112
Marriage Law	113
Failure of Health Law.....	113
Registration Report of 1905.....	119
Vital Statistics	120
State Laboratory of Hygiene.....	5
Sanitary Schoolhouses and Teaching Hygiene in Public Schools.....	8

	Page
State Hospital for Indigents, Consumptives.....	8
Salem, Account of Smallpox.....	20
Sanitary Survey of Schoolhouse at Hope.....	30
Sharpsville—	
Inspection of Schoolhouse.....	34
Proclamation of Condemnation.....	35
Communication from Trustee.....	46
Salary of Deputy State Inspector of Foods and Drugs.....	53
State Soldiers' and Sailors' Home, Epidemic of Typhoid.....	91
Smallpox at Thorntown	11
Smallpox at Colfax	21
Smallpox in Shelby County.....	23
Smallpox at Connersville	45
Smallpox at Columbus	45
Smallpox at Salem	20
Smallpox at Columbus	89
Smallpox at Nashville	90
Smallpox, Table of Deaths by Months for Six Years.....	190
Smallpox, Record of Deaths by Months.....	191
Table II A.—Recapitulation of Table II.....	225
Table III.—Deaths by Counties, Months, Color, Sex, etc.....	228
Table IV.—Deaths by Geographical Sections.....	258
Table V.—Death Rates from Important Causes, Geographical Sections	262
Table VI.—Annual Death Rates of Principal Cities for Six Years....	266
Table A.—Births by Months, Color, etc.....	267
Table B.—Births, Number of Children Born to Each Mother.....	270
Table B.—Grouped Ages of Parents, Still, Plurality and Illegitimate..	274
Table C.—Marriages by Months, Color and Nationality.....	278
Table D.—Marriages—Grouped Ages.....	282
Thorntown, Account of Smallpox.....	11
Typhoid Fever Epidemic at State Soldiers' Home.....	73
Summary of Cases	74
Water Supply	75
Sanitary Survey of Buildings.....	76
The Hospital	76
Ice Boxes	78
Garbage	78
Dairy	78
Summary	78
Possible Methods of Transmission.....	79
Recommendations	79
Management of Hospital	80
Restaurant	81
Tuberculosis	81
Sanitary Rules	81
Typhoid Fever in Union County	94
Typhoid Fever at Etna Green.....	97
Table Showing Number of Deaths from Certain Diseases.....	150

	Page
Tuberculosis, Havoc Wrought by.....	151
Tuberculosis, Record by Months.....	156
Typhoid Fever, Record by Months.....	170
Table I.—Deaths, All Causes, with Rates.....	199
Table II.—Deaths, All Causes, by Months.....	204
Table II.—Deaths, All Causes, by Ages.....	211
 Union County Typhoid Fever.....	 94
 Vital Statistics—Visits of Secretary.....	 6
Thornton	11
Atlanta	11
Kentland	12
Muncie	12
Greencastle	13
Bloomington	13
Noblesville	13
Loogootee and Salem	20
Colfax	21
Brazil	38
Washington, D. C.....	38
Hope	44
Connersville	45
Columbus	45
Eaton	87
Ft. Wayne	88
Auburn	89
Columbus and Nashville	89
 Vital Statistics—	
The Census	121
Estimated Population	123
Increase of Population	125
Population Constitution	125
Registrar's Returns	126
Marriage Rates	128
Birth Rates	129
Death Rates	131
Influence of Sex.....	132
Influence of Age.....	132
Influence of Race.....	132
Excess of Negro Mortality.....	133
Other Influences	133
Influence of Density.....	134
Weekly Death Rates	135
Zymotic Death Rates.....	135
Infantile Death Rates.....	135
High and Low Death Rates.....	138
Correction of Death Rates.....	139
Classification of Causes of Death.....	140

	Page
Registration of Sickness.....	141
Duration of Life.....	142
Life Tables	144
Study of Statistics for 1905—Births.....	145
Marriages	146
Deaths	146
Causes of Death.....	147
Principal Causes of Death.....	148
Violence, Record of Deaths by Months.....	187
Vision Chart for Schools.....	389
Value and Importance of Vital Statistics.....	390
 Washington, D. C., Account Conference of State Board of Health....	 38
Yellow Fever at Marion.....	96

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